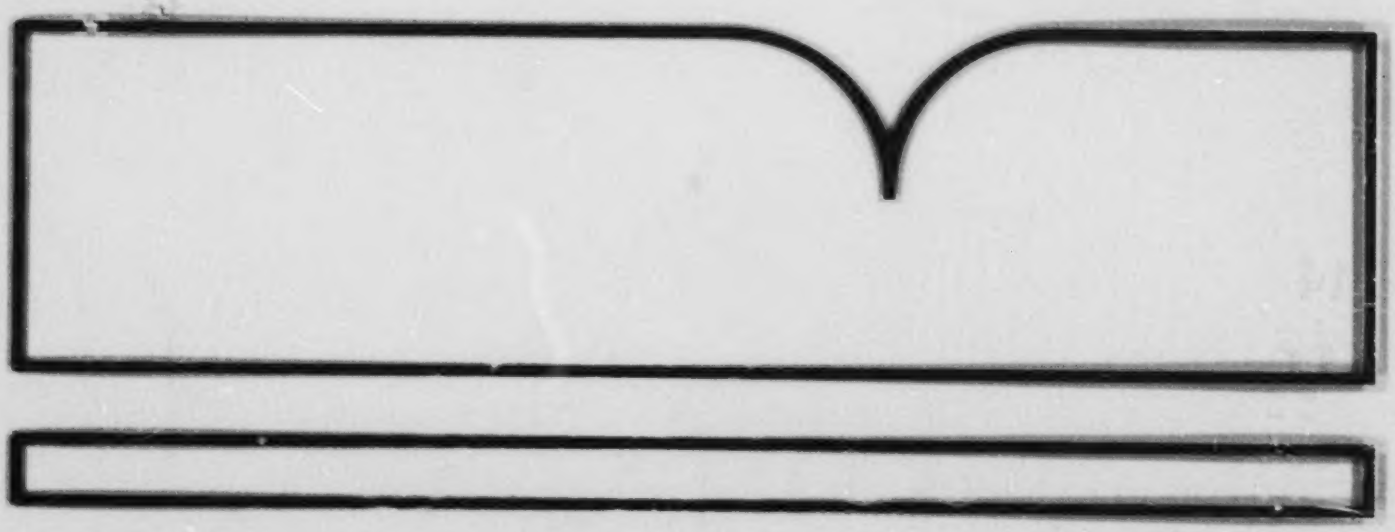
PB89-204812

Superfund Record of Decision (EPA Region 6): South Valley (PL-83), New Mexico (First Remedial Action), September 1988

(U.S.) Environmental Protection Agency, Washington, DC

30 Sep 88



U.S. Department of Commerce
National Technical Information Service
NTIS

PB89-204812

United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R06-88/043
September 1988

EPA

Superfund Record of Decision:

South Valley (PL-83), NM

REPRODUCED BY
U.S. DEPARTMENT OF COMMERCE
NATIONAL TECHNICAL INFORMATION SERVICE
SPRINGFIELD, VA. 22161

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. EPA/ROD/R06-88/043	2.	3. Recipient's Accession No. PB89 204812/AS
4. Title and Subtitle SUPERFUND RECORD OF DECISION South Valley (PL-83), NM First Remedial Action			5. Report Date 09/30/88 6.
7. Author(s)			8. Performing Organization Rept. No.
9. Performing Organization Name and Address			10. Project/Task/Work Unit No. 11. Contract(C) or Grant(G) No. (C) (G)
12. Sponsoring Organization Name and Address U.S. Environmental Protection Agency 401 M Street, S.W. Washington, D.C. 20460			13. Type of Report & Period Covered 800/000 14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

The Former Air Force Plant 83/General Electric Operable Unit (PL-83) is a portion of the South Valley Superfund site in Albuquerque, New Mexico. The South Valley Superfund site is an area surrounding the City of Albuquerque Municipal Water Well known as San Jose No. 6. The General Electric (GE) property is located in the western portion of the site. The South Valley site is situated in an industrial area, but there are residences immediately north of the GE property. The GE property has been the site of manufacturing operations since 1948 when the Eidal Manufacturing Company had a welding operation onsite. In 1951 the Atomic Energy Commission, through American Car Foundry, took over the property and conducted machining of metal parts, plating, welding, and other activities. This continued until 1967 when the Air Force took over the property and converted the plant into an aircraft engine manufacturing plant operated by General Electric. The plant was sold to General Electric in 1983, and currently produces aircraft engine parts. The contaminants which caused the listing of the South Valley site on the NPL consisted mainly of industrial solvents. Investigations into the GE property were conducted in 1984, 1985, 1987, and 1988 by the Air Force under a Memorandum of Understanding with EPA. The GE property is heavily built up, with the majority of the site paved or covered with buildings. As a military contracting

(See Attached Sheet)

→ go to pg 2

17. Document Analysis a. Descriptors

Record of Decision
South Valley (PL-83), NM
First Remedial Action
Contaminated Media: gw, soil
Key Contaminants: metals, VOCs (PCE)

b. Identifiers/Open-Ended Terms

1

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 77
	20. Security Class (This Page) None	22. Price A05 $15.95/E6.95

EPA/ROD/R06-88/043
South Valley (PL-83), NM
First Remedial Action

16. ABSTRACT (continued)

facility, access to the plant is tightly controlled and there is no regular access other than by employees. Three areas of contamination have been identified at the site: four hazardous waste storage areas which were used for chemical storage, the north parking lot (a former dirt parking lot which was sprayed with oil as a dust control measure), and the DWB-2 area which contains methylene chloride and freon contamination. The volume of contaminated soils is estimated to be 36,000 yd^3. In addition to soil contamination, ground water contamination occurs at depths of up to 160 feet. The primary contaminants of concern affecting the ground water and soil are VOCs including PCE, and metals.

The selected remedial action for this site includes: installation of soil vapor extraction wells; extraction of soil vapor under vacuum; decontamination of effluent air through a carbon adsorption system; further sampling and definition of soil contamination; installation of ground water extraction wells in both the shallow aquifer and the deeper zone; treatment of extracted ground water with air stripping followed by carbon adsorption and reinjection of treated water into the aquifers (chemical or physical treatment of ground water will occur where metal concentrations exceed background or ARARs); and further definition of ground water contamination through installation and sampling of additional monitoring wells. The estimated present worth cost for soil remediation is $1,820,000. No figures are given in the ROD for the ground water remedial action.

RECORD OF DECISION

FORMER AIR FORCE PLANT 83/GENERAL ELECTRIC SOUTH VALLEY SUPERFUND SITE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION SIX

SEPTEMBER 1988

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VI
1445 ROSS AVENUE, SUITE 1200
DALLAS, TEXAS 75202

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Former Air Force Plant 83/General Electric Operable Unit, South Valley Superfund site, Albuquerque, New Mexico

STATEMENT OF PURPOSE

This decision document outlines the selected remedial action for the Former Air Force Plant 83/General Electric operable unit of the South Valley Superfund site in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA); the National Oil and Hazardous Substance Pollution Contingency Plan, 40 CFR Part 300, November 20, 1985.

The State of New Mexico (through the New Mexico Environmental Improvement Division) has been provided with notice and an opportunity to review and comment on the remedial investigation and feasibility study, along with EPA's proposed remedial action, and an opportunity to review and to comment on the Record of Decision including without limitation, the technology and degree of treatment therein. The response from the New Mexico Environmental Improvement Division can be found in Attachment 1 of the accompanying Summary of Remedial Alternative Selection.

STATEMENT OF BASIS

This decision is based on the administrative record for the Former Air Force Plant 83/General Electric Operable Unit for the South Valley Superfund site. The index of the administrative record found in Attachment 2 of the Summary of Remedial Alternative Selection identifies the items which comprise the administrative record.

DESCRIPTION OF THE REMEDY

Upon review of the information contained in the administrative record, it is EPA's judgment that soil vapor extraction of soils from the surface down to the water table in the areas known as Hazardous Waste Storage Areas 1, 3 and 4 as indicated in Figures 1 and 2 of this Declaration appears to meet statutory requirements and to best satisfy the selection criteria and appropriate guidance in relation to the other solutions evaluated for soils. Further definition of the extent of contamination north of Hazardous Waste Storage Areas 3 and 4 and south of Hazardous Waste Storage Area 1 is required. Groundwater in the shallow groundwater zone, that above the clay aquitard appearing at approximately 30 feet below ground surface, and groundwater to a depth of 160 feet below ground level, will be

recovered through the use of extraction wells and brought to the surface for treatment. The lateral extent of contamination requiring recovery is estimated in Figures 3 and 4. There are two areas in which the lateral extent of contamination must be further defined through the installation and sampling of additional monitoring wells. These are the northern extent of contamination in the shallow zone as shown in Figure 3 and the eastern extent of contamination in the aquifer below the shallow zone downgradient of the southeastern portion of the General Electric property as shown in Figure 4. The areas of potential contamination in Figures 3 and 4 are not intended to limit the areas in which additional groundwater sampling may be necessary. In addition to these two areas, wells in the intermediate zone beneath the Chevron property will be resampled during remedial design to confirm the level on contaminants found in sampling during 1987 upon which the eastern extent of groundwater recovery is dependent. Groundwater recovered will be treated with a combination of air stripping followed by carbon adsorption. The effluent air from the air stripping process will also be passed through a carbon adsorption system for removal of contaminants. The carbon from both systems will be taken to an offsite facility for regeneration of the carbon and destruction of the contaminants.

The selected remedy also includes the monitoring of the area groundwater both during and after completion of remediation to ensure the effectiveness of the selected remedy. A more detailed description of the remedy and an explanation of how it meets statutory requirements is contained in the "Summary of Remedial Alternative Selection" which follows this Declaration. The remedial action will be reviewed every five years after its initiation to assure that human health and the environment are being protected by the remedial action being implemented.

DECLARATION

The remedy described above is protective of human health and the environment, attains applicable or relevant and appropriate Federal and State requirements and is cost-effective compared to the other alternatives examined. This remedy satisifies the statutory preference for treatment that reduces toxicity, mobility or volume as a principal element. Finally, it has been determined that this remedy utilizes permanent solutions and alternative technologies to the maximum extent practicable.

September 30, 1988
Date

Robert E. Layton Jr.
Robert E. Layton Jr., P.E.,
Regional Administrator

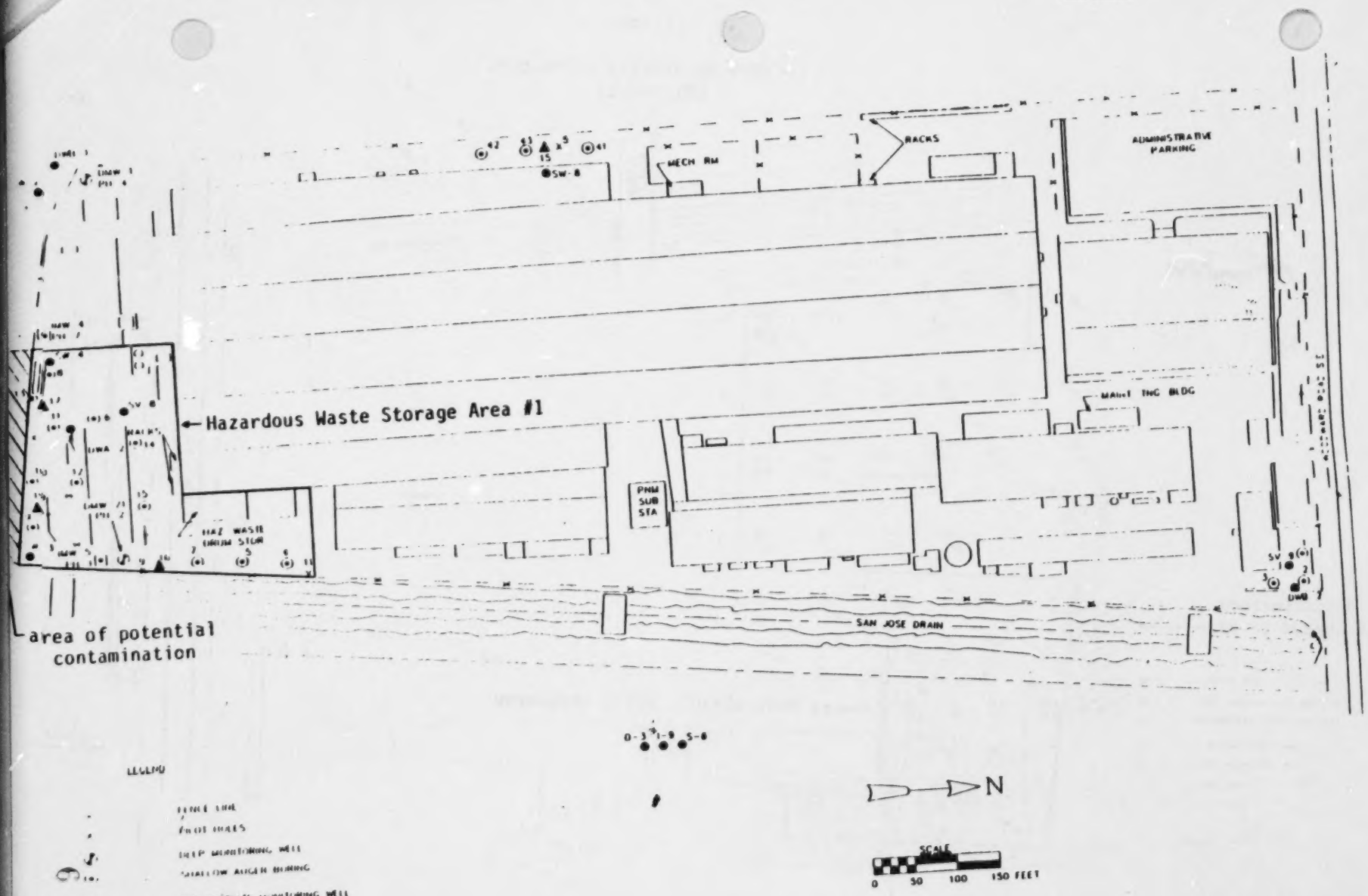


FIGURE ONE

Soil Vapor Extraction Area

(South)

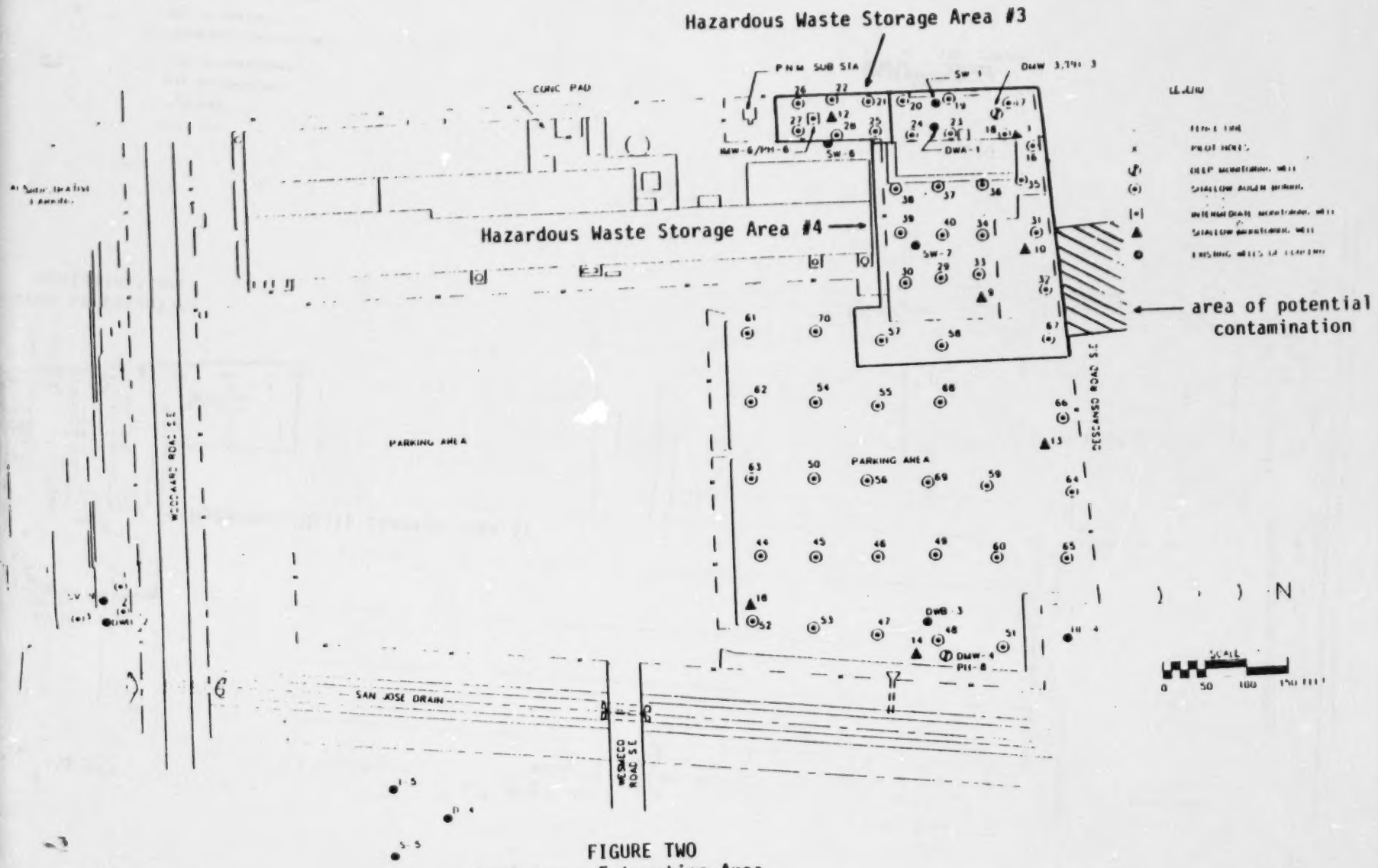
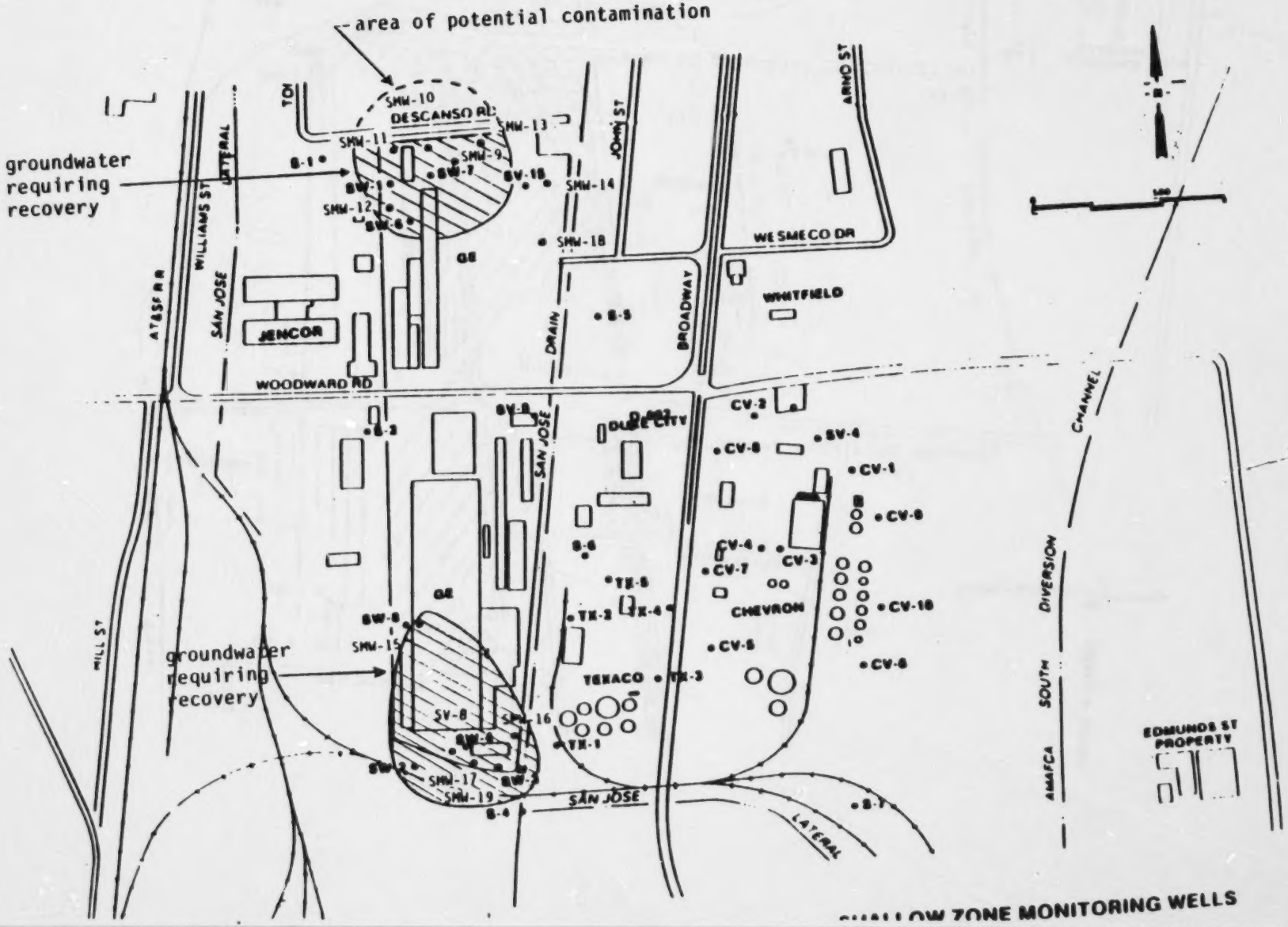


FIGURE TWO
Soil Vapor Extraction Area

(North)


area of potential contamination
groundwater requiring recovery
groundwater requiring recovery
SMW-10
DESCANSO AV
SMW-11
SMW-13
SMW-9
SMW-7
SV-10
SMW-14
SMW-12
SMW-18
B-1
SW-1
SW-6
QE
JENCOR
WOODWARD RD
ATSF R R
WILLIAMS ST
LATERAL
SAN JOSE
DRAIN
JOHN ST
ARNO ST
WESMECO DR
WHITFIELD
BROADWAY
B-5
B-2
SV-8
DUBLE CITY
SAN JOSE
CV-2
SV-4
CV-8
CV-1
CV-9
CV-4
CV-3
CV-7
B-6
TX-5
TX-2
TX-4
CHEVRON
CV-10
CV-5
CV-6
TEXACO
TX-3
MILL ST
SW-8
SMW-15
SV-8
SW-5
SMW-16
TX-1
SW-2
SMW-17
SW-3
SMW-19
B-4
SAN JOSE
LATERAL
B-7
CHANNEL
DIVERSION
SOUTH
AMAFCA
EDMUNDS ST PROPERTY
SHALLOW ZONE MONITORING WELLS

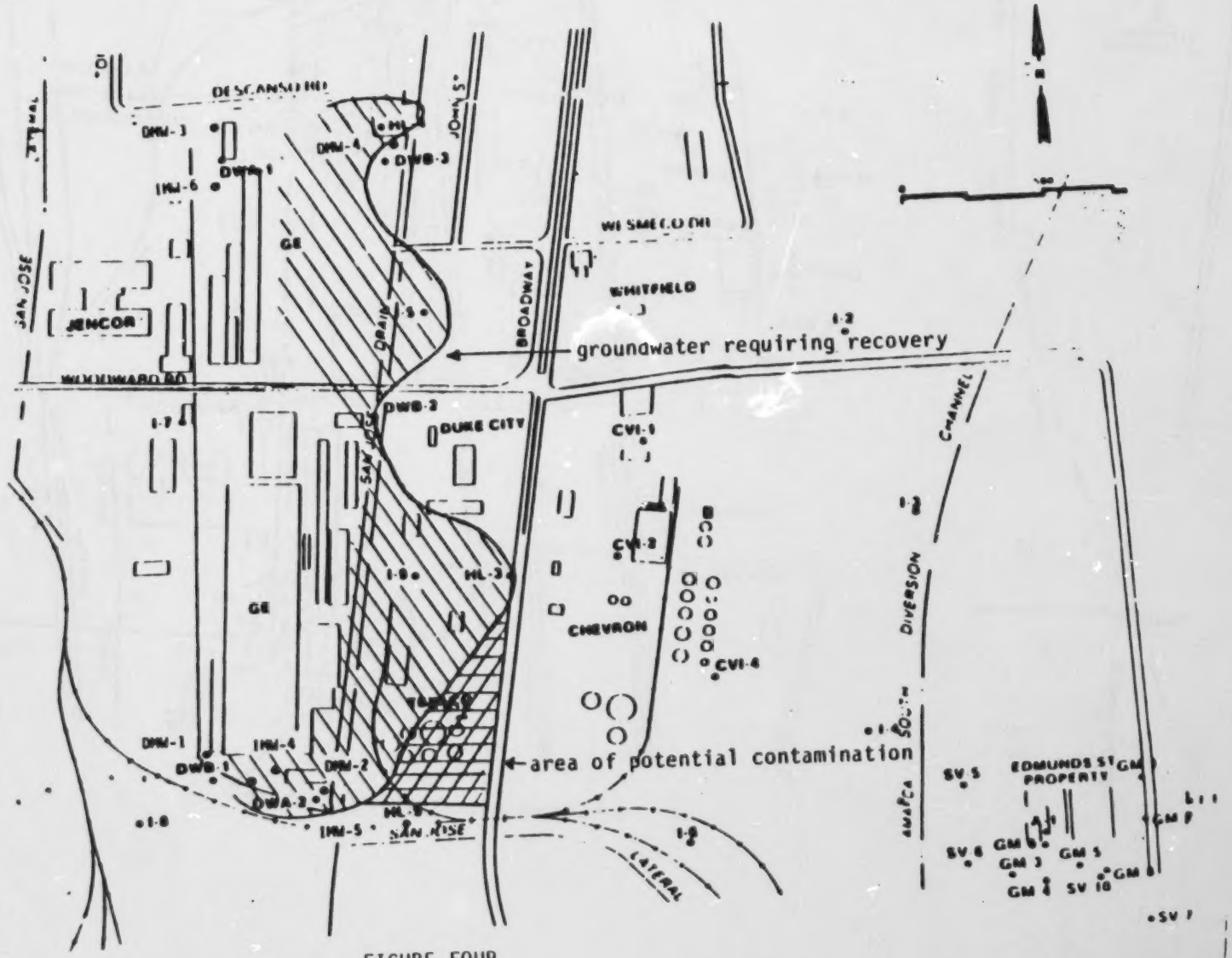


FIGURE FOUR

INTERMEDIATE ZONE MONITOR WELL

SJ 6 SUPERFUND SITE

TABLE OF CONTENTS

DECLARATION FOR THE RECORD OF DECISION	i
LIST OF TABLES	viii
LIST OF FIGURES	viii
LIST OF ATTACHMENTS	viii
SUMMARY OF REMEDIAL ALTERNATIVE SELECTION	1
SITE HISTORY	2
ENFORCEMENT ANALYSIS	3
COMMUNITY RELATIONS	3
SCOPE AND ROLE OF THIS OPERABLE UNIT	4
SITE CHARACTERISTICS	4
SITE RISKS	5
DESCRIPTION OF ALTERNATIVES	8
COMPARATIVE ANALYSIS OF ALTERNATIVES	10
SELECTED REMEDY	16
STATUTORY DETERMINATIONS	17
RESPONSIVENESS SUMMARY	17

LIST OF TABLES

Table One - Analysis of Criteria for Selection of Remedy for Soils 14

Table Two - Estimated Costs 15

LIST OF FIGURES - DECLARATION

Figure One - Soil Vapor Extraction Area (South) iii

Figure Two - Soil Vapor Extraction Area (North) iv

Figure Three - Shallow Zone Groundwater v

Figure Four - Intermediate Zone Groundwater vi

LIST OF FIGURES - SUMMARY OF REMEDIAL ALTERNATIVE SELECTION

Figure Five - South Valley Site Map 1

Figure Six - Areas Investigated On General Electric Property 2

Figure Seven - Site Stratigraphy 6

LIST OF ATTACHMENTS

Attachment 1 - State of New Mexico Response

Attachment 2 - Administrative Record Index

Attachment 3 - Responsiveness Summary

Attachment 4 - ARARs

Attachment 5 - Summary of Analytical Results

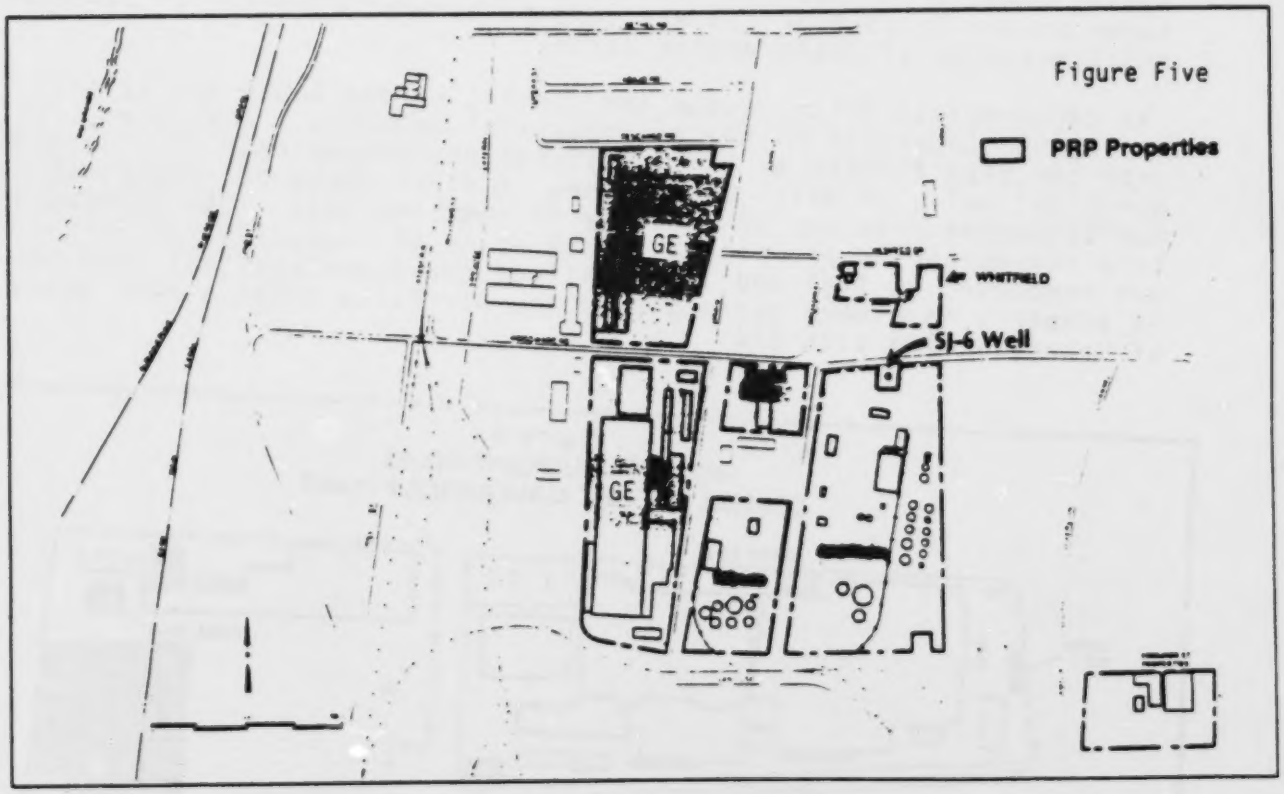
Attachment 6 - Groundwater Standards

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION

South Valley, Albuquerque, New Mexico
Former Air Force Plant 83/General Electric Operable Unit

Site Location and Description

The General Electric property (GE) is a portion of the South Valley Superfund site in Albuquerque, New Mexico. The South Valley Superfund site is an area surrounding the City of Albuquerque Municipal Water Well known as San Jose 6, near the intersection of Broadway and Woodward Road in southern Albuquerque. The GE property is located at 336 Woodward Road, S.E. Figure 5 below shows the larger South Valley site with the GE property in the western portion of the site. Figure 6 on the next page shows the GE property in more detail.



The South Valley site is located in an industrial area, but there are residences immediately north of GE. Figure 6 shows the various potential sources of contamination within the GE property. The investigation also included the investigation of contamination in the groundwater under the property.

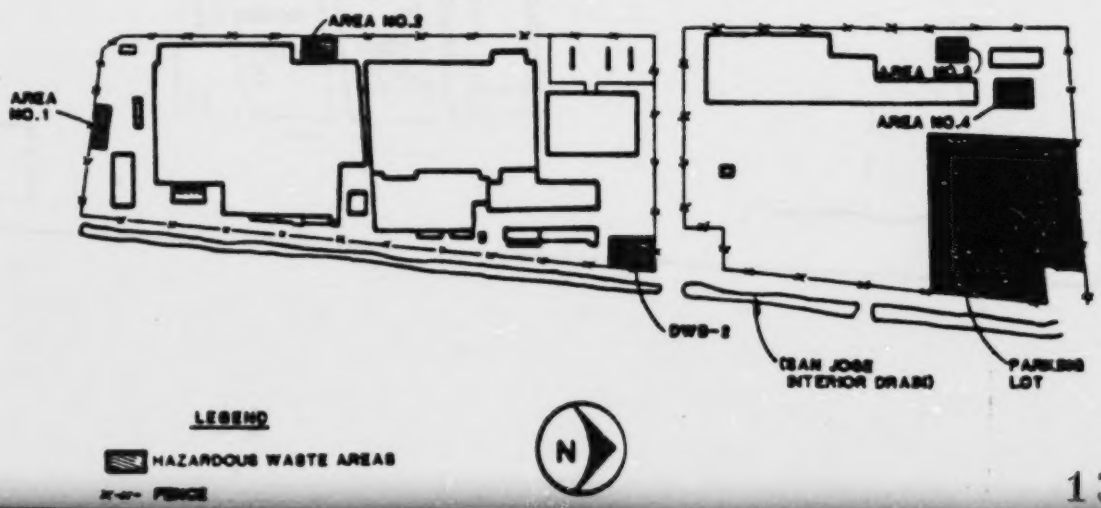
Site History

GE was investigated as a potential source of the contamination which appeared in the municipal well SJ-6. The property has been the site of manufacturing operations since 1948 when the Eidal Manufacturing Company had a welding operation onsite. In 1951 the Atomic Energy Commission, through American Car Foundry, took over the property and conducted machining of metal parts, plating, welding and other activities. This continued until 1967 when the Air Force took over the property and converted the plant into an aircraft engine manufacturing plant which was operated by General Electric. The plant, known as Air Force Plant 83 was sold to General Electric in 1983 and still produces aircraft engine parts.

The contaminants which caused the listing of the South Valley site on the NPL consisted mainly of industrial solvents. The investigation into the site focused on six industrial properties near the contaminated municipal well, of which GE was one. A first round of investigation was conducted into the GE property in 1984 and 1985. The results of this investigation prompted a second round of investigation which was conducted in 1987 and 1988. All of the investigations into the GE property have been conducted by the Air Force under a Memorandum of Understanding with EPA.

Figure 6

FORMER USAF PLANT NO. 83
GENERAL ELECTRIC ALBUQUERQUE PLANT



Enforcement Analysis

There is a list of several potentially responsible parties (PRPs) for the property on which this operable unit is located. These include past and present owners and operators of the property. Primarily these are the Eidal Manufacturing Company, the United States Department of Energy, American Car Foundry, Dow Chemical, the United States Air Force and General Electric. All of the Superfund work on the General Electric property to date has been conducted by the Air Force.

Community Relations

Due to the possibility of contamination within the San Jose Wellfield, which serves as a major source of water for the City of Albuquerque, the site has received extensive media attention. However, because of the heavily industrialized nature of the site and the lack of exposure to contaminants, citizen concern has been limited to the immediate area.

Although no citizen groups have been formed to deal specifically with the problems posed by the South Valley site, several groups have expressed a general interest regarding overall environmental concerns in the Albuquerque area.

On August 23, 1988, EPA issued a press release and the Proposed Plan fact sheet. The press release was mailed to all news organizations in the Albuquerque area, while the fact sheet was mailed to approximately 150 local residents and local officials. Extra copies of the fact sheet were provided to the three local repositories for distribution and display.

In accordance with CERCLA, Section 117, the press release and the fact sheet announced the comment period which began August 23, 1988. The comment period was originally to end September 16, 1988, but the U.S. Air Force failed to deliver the feasibility study to the public repositories until September 1, 1988. The public comment period was extended until September 23, 1988 and notices of the change in the comment period were mailed to area residents and local officials. A workshop was held September 1, 1988, for area residents in a local community center to explain the results of the remedial investigation and feasibility study and to discuss the proposed plan. Approximately 60 people attended this meeting. The official public meeting to receive public comment was held on September 13, 1988. Approximately 45 people attended this meeting. The Responsiveness Summary which outlines the comments received and EPA's responses is included in Attachment 3.

Scope and Role of This Operable Unit

This operable unit is one of four currently underway for the South Valley Superfund Site. These four operable units are Edmunds Street Groundwater, Edmunds Street Source Control, Former Air Force Plant 83/GE, and the overall SJ-6 operable unit. The division of the site into these parts follows from the nature of the site. The South Valley site is a large area surrounding the municipal well San Jose #6. Within this larger area are a number of industrial properties owned and operated by different groups and individuals. Each of the two source control operable units deals with a single industrial property that, through the investigation process, has been shown to have CERCLA actionable contamination that needs to be corrected. The SJ-6 operable unit is intended to deal with the site as a whole, leading to a decision about the larger groundwater problem that caused this area to become a Superfund site, while the source control operable units eliminate the sources of groundwater contamination, including plumes of contamination that can be traced directly to a particular property. The Former Air Force Plant 83/GE operable unit is one of these source control operable units.

Site Characteristics

The GE property is heavily built up. Most of the site is paved and those areas which do not contain buildings frequently have underlying or overhead utility conduits. As a military contracting facility, access to the plant is tightly controlled and there is no regular access other than by employees.

The areas investigated as potential contaminant sources are shown in Figure 2. These areas are: former hazardous waste storage areas one through four (HWSA #1, etc.), the north parking lot, and the DWB-2 area. The former hazardous waste storage areas were once used for chemical storage. The north parking lot was once a dirt parking lot. Before the area was paved, it was sprayed with oil as a dust control measure. The DWB-2 area was added to the list of potential source areas when methylene chloride and freon were found during the installation of a groundwater monitoring well in this location.

The remedial investigation uncovered scattered evidence of volatile organic chemical contamination in soils in all of the investigated areas. However, the primary locations of volatile organic chemicals were in the southern end of the plant near HWSA #1 and in the northwest corner of the plant near HWSAs #3 and #4. A thin layer of semivolatile contamination was found in what appears to be fill material in HWSA #1. Petroleum was found in soils in the north parking lot and in HWSA #3. A summary on analytical results from site samples can be found in Attachment 5.

In addition to contaminant sources, groundwater beneath the plant Figure 7. Of primary interest is the silty clay aquitard at 25 to 40 feet below the surface. This clay aquitard appears to divide groundwater above 30 feet in depth from the deeper water bearing zones. This dividing layer is absent in the southeast corner of the site.

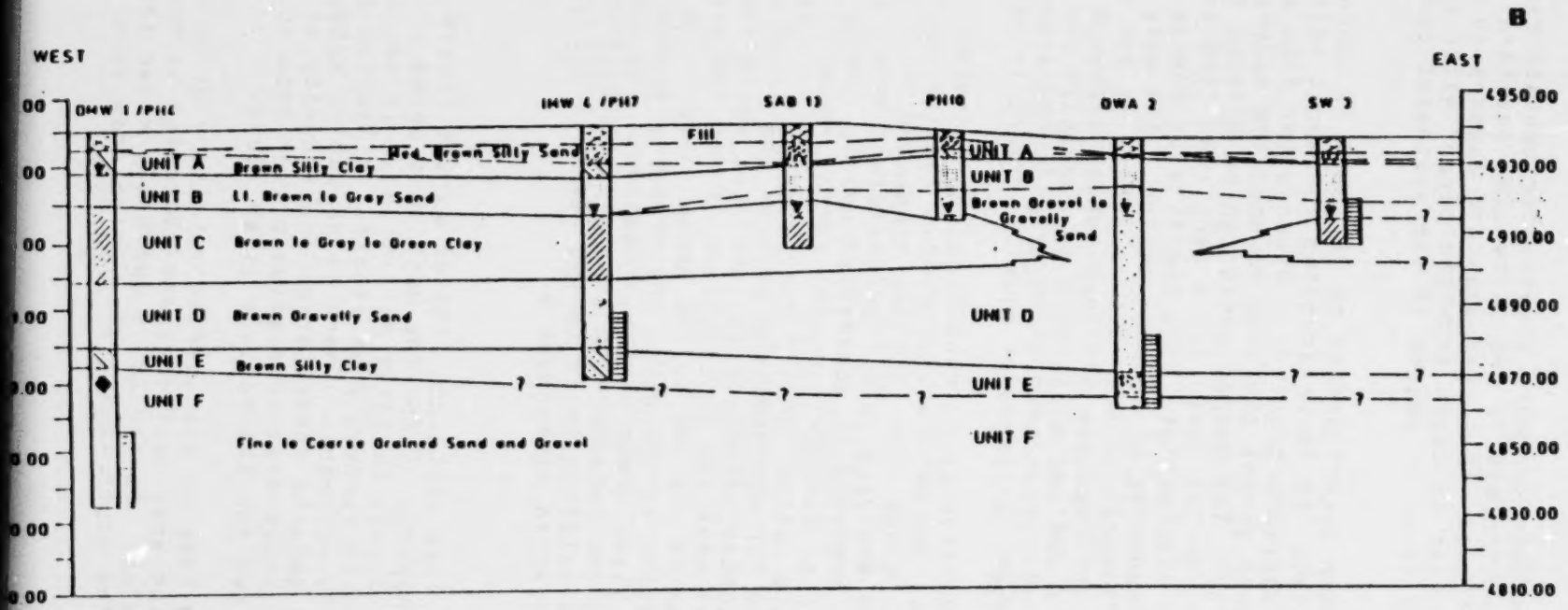
The shallow groundwater zone (surface to 30 feet) is composed of fluvial sand and gravel. It is unsaturated for about half of its thickness and has a variable gradient. Groundwater flow above 30 feet is generally south across the site towards the southeastern corner of the property. The deeper zones can be divided into an intermediate zone (40 to 110 feet) and a deep zone (110 to several thousand feet). The intermediate zone consists of coarse-grained clastics that were deposited by channel action. The deep zone consists of primarily finegrained sand but is laterally and vertically heterogeneous. The intermediate and deep zones, although hydraulically connected, were defined separately to emphasize the differences in lithology, primarily grain size and hydraulic characteristics. At depths below 30 feet, groundwater flow is generally west to east.

In the shallow groundwater zone, contamination by volatile organic solvents, isophorone, and metals was found. The indications of metals contamination comes from sampling conducted in 1985 and 1987. The resulting metals analyses were not consistent among sampling rounds. The actual presence or absence of metals contamination will have to be confirmed by further sampling during remedial design. The levels of organic contaminants are particularly significant in the far southern and far northwestern ends of the property. Below the shallow zone, contamination is concentrated above the 140 foot zone. Only one well near the southeastern end of the property, DMW-2, showed contamination in the 140 to 160 depth range. The eastern extent of contamination varies along the property boundary. Figures 3 and 4 illustrate these areas of contamination. The eastern boundary of contamination in the intermediate zone will be confirmed through sampling of new and existing wells during remedial design. Analytical results are summarized in Attachment 5.

Site Risks

Current site risks from soils are limited by the nature of current operations. The property is for the most part paved or covered by buildings. Direct access to soils is limited. In addition, the population which could currently be exposed is limited to workers who are not normally outdoors. There is no public access to the plant as this is a defense installation and security at the facility is tight. Current risks from inhalation either from soil gases or dust are also limited for the reasons given above.

Groundwater is the City of Albuquerque's primary drinking water source. Most of the area residents are connected to the municipal drinking water system. As far as is currently known there are only three wells near the South Valley site which draw water from the 50



LEGEND

- Fill
- Silty Clay
- Silty Sand
- Sand
- Clay
- Sand and Gravel
- Screened Interval
- Shelby Tube Sample
- Water Level

0 50 100

HORIZONTAL SCALE (FEET)

CROSS-SECTION A-B
FORMER USAF PLANT NO. 83
ALBUQUERQUE, NEW MEXICO

FRED C HART ASSOCIATES, INC

FIGURE 7

to 100 foot zone. None of these are currently used as a drinking water supply. One is used by a construction business, one is used for irrigation purposes and the third was used for drinking water, but the owner is now connected to the municipal water system. The municipal water system draws from the lower portion of the deep groundwater zone.

When potential risks at the site were evaluated it was conservatively assumed that the plant property would be developed into a residential area. It was also assumed that water from both the above 30 foot zone and from the 30 to 160 foot zone would be used for domestic purposes.

Risk from site soils seems very limited. The shallow soils up to depths of two feet did not pose a significant risk either through ingestion of volatile or semi-volatile organic contaminated soils. Analysis of possible inhalation of contaminants based on soil gases both from shallow or greater depth soils did not show significant potential for risk.

Estimates of risk posed by the contamination in groundwater did show areas requiring remediation to depths of up to 160 feet. Use of Federal and State standards gives a projection of contaminated groundwater requiring remediation as shown in Figure 3 for the shallow groundwater and Figure 4 for the groundwater up to the 160 foot depth. Prominent among the standards requiring this remediation is the New Mexico Water Quality Control Commission (NMWQCC) regulation 3-103.A and the associated definition of the term "toxic pollutant" found in NMWQCC regulation Section 1-101.UU. The regulation in question states that if more than one water contaminant affecting human health is present, the toxic pollutant criteria of Section 1-101.UU for the combination of contaminants shall apply. This involves the use of combined risk from contaminants which are on the toxic pollutant list included in Section 1-101.UU and that the combined risk shall not exceed a level of excess lifetime risk of more than one cancer per 100,000 exposed persons. The primary contaminants of concern for carcinogenic effects include 1,1 dichloroethene, isophorone, and tetrachloroethene. A sample of the calculation necessary to determine combined risk and the individual standards for chemical of concern at the South Valley Superfund Site can be found in Attachment 6.

Description of Alternatives

The following are alternatives that were examined for use in remediation of the contaminated areas. These are separated into methods for soils and for water.

SOILS

As the soils appear to pose no direct risk through exposure, the focus of remedial actions was elimination of volatile organic contaminants contributing to groundwater contamination.

1) No Action - No action would be taken to remediate the contaminated soils. This options is included as a baseline for comparison with the active cleanup alternatives.

2) Soil Vapor Extraction - Vapor extraction consists of injection of fresh air into the subsurface and recovery of the air through air-recovery wells operated under a vacuum. Volatile contaminants contained in the material through which the air passed will move into the vapor phase. The air containing the contaminants is then drawn out through the air-recovery wells. The air is then run through activated carbon for removal of the contaminants from the air. The clean air is released and the activated carbon is regenerated offsite.

3) Incineration - The contaminated soils would be excavated and incinerated in a RCRA approved offsite or mobile onsite incinerator. Organic contaminants would be destroyed during combustion within the incinerator.

4) Soil Flushing - The purpose of soil flushing is to intermittently or continuously flush the soil with water until water percolating through the flushing area is at or below a proposed cleanup level. The water is applied through sprinklers or distribution pipes. The applied water is allowed to percolate through the soil and collected with extraction wells. The collected water is then treated. Insoluble compounds are removed through the use of surfactants or additives in the flushing water. Which additives are used depends on the contaminants whose removal is desired.

5) Soil Aeration - Soil aeration works through providing sufficient contact between contaminated soils and air to allow volatile compounds to vaporize. Soils would be excavated and fed into a soil dryer. Volatile compounds would be volatilized from the soil in the dryer. The air from the dryer would then be treated in a three stage process for the removal of particulates and organic vapors. Treated soils would be returned to the excavation sites.

6) Stabilization - Chemical fixation/stabilization mixes waste with a binder material to immobilize the contaminants. Fixation involves a chemical reaction between one or more of the waste components with

a solid matrix, either one existing in the waste or one added as part of the fixation process. Stabilization involves physically trapping the contaminants without a chemical reaction. It does not reduce the toxicity of the material but reduces the mobility of the contaminants.

7) RCRA Cover - The purpose of this method is to limit the infiltration of stormwater through site soils by constructing an impermeable cover over the site. This cover would consist of a low permeability clay or geotextile and a drainage net over a synthetic liner. This would in turn be topped with fill material and topsoil. The topsoil would be seeded to promote vegetation to control erosion.

8) Off-site disposal - Under this alternative all soils determined to contain chemicals of concern, would be excavated, transferred into trucks, and then transported to and disposed of in a RCRA approved landfill.

GROUNDWATER

Groundwater remediation is focused on elimination of organic contaminants that pose a carcinogenic risk like 1,1 dichloroethene.

1) Groundwater Extraction - This involves bringing groundwater to the surface through extraction water wells for treatment.

a) Groundwater Treatment/Air Stripping - This groundwater treatment method operates by mixing water contaminated with volatile compounds with air allowing the volatile chemicals to evaporate into the air. The air is collected as it leaves the treatment unit and passed through a filter where the contaminants are collected.

b) Groundwater Treatment/Carbon Adsorption - This method passes contaminated water through activated carbon where the contaminants are adsorbed onto the carbon. The contaminated carbon is then taken to an offsite regeneration facility.

Comparative Analysis of Alternatives

Each alternative was evaluated on the following criteria:

1. Short-term effectiveness: Protection of human health and the environment during construction and implementation.

2. Long-term effectiveness and permanence: Ability of a remedy to amintain reliable protection of human health and the environment over time, after construction and implementation are complete.

3. Reduction of toxicity, mobility, or volume: Anticipated performance of the specified treatment technologies.

4. Implementability: Technical and administrative feasibility of alternatives and the availability of required resources.

5. Cost: Cost of construction and operation and maintenance.

6. Compliance with ARARs: Compliance with applicable or relevant and appropriate standards (ARARs) from existing laws and regulations. These are standards or regulations that either do apply or at least should be considered when looking at an alternative.

7. Overall protection of human health and environment: How the alternative as a whole protects and maintains protection of human health and the environment.

8. State Acceptance: The State's preferences or concerns about the alternatives.

9. Community acceptance: The community's preferences or concerns about the alternatives.

The following paragraphs will examine each of the alternatives for these criteria. For comparative purposes, satisfaction of the criteria will be rated as low, moderate or high. These "ratings" are summarized in Table 1.

First the methods for remediating the volatile organic contaminants in soils will be examined. Then groundwater remedial methods will be discussed.

Short-term effectiveness - The idea of short-term effectiveness involves the protection of human health and the environment during the cleanup. The no action alternative meets this criteria since it doesn't involve any remediation which might result in disturbance of soils. The vapor extraction method meets this criteria since it does not disturb the contaminated soils to any great extent. The volatile chemicals in the soil have no chance to escape and expose the workers or the public. Soil flushing meets this criteria for similar reasons; the contaminated material is not disturbed so there is little opportunity for the contaminants to escape. Four of the alternatives, incineration, soil aeration, offsite disposal and stabilization fail this criteria as they require that the soils be excavated or at least disturbed during the treatment process. While the soil is being excavated or mixed, the volatile chemicals in the soil will have the opportunity to escape exposing both the workers and the public. The RCRA cover alternative would involve some minor soils work during its installation and would provide limited opportunity for escape of the volatile chemicals in the soil.

Long-term Effectiveness and Permanence - When the alternatives are examined for how effective and permanent they will be after the remediation is complete, no action fails as it does nothing to improve site conditions. Stabilization will be vulnerable to break down of the stabilized materials over time and the contaminants will be only contained, not destroyed. Similar problems exist with the RCRA cap and the Offsite Disposal options. The contaminants would still be present and should the integrity of the landfill or cap be breached in some manner, the material would be subject to the effects of the environment. The remaining alternatives provide better long-term effectiveness. Vapor extraction, soil aeration and soil flushing remove contaminants from the soils for further treatment. Incineration would involve destruction of the organic contaminants in the incineration process.

Reduction of toxicity, mobility, or volume - No action does nothing to permanently reduce the toxicity, mobility or volume of the contaminated material. Off-site landfill disposal and the RCRA cap will reduce mobility through increased isolation of the contaminants from the environment, but will not actually reduce their inherent capacity for migration. Stabilization would also reduce mobility throu protection from water infiltration, but would not reduce the contaminants' toxicity and would increase the volume of material. Incinerat would provide for reduction of all three of the desired criteria through destruction of the organic contaminants. Vapor extraction, soil flushing and soil aeration would also reduce toxicity, mobility and volume provided the carbon used in the second stage of treatment is regenerated.

Implementability - No action is easily implementable as it does not involve doing anything. The other technologies have been used at other sites and involve methods that could be applied at GE. There are some physical limitations. The site contains a heavy concentration of buildings and buried utilities. These would significantly impede the excavation of soils required for the soil aeration, offsite disposal and incineration methods. They would also obstruct the distribution of water for the soil flushing option. Vacuum extraction could reach into areas containing utilities and under buildings to the extent of the effective radius of the air-extraction wells. The RCRA cap option would not extend under the existing buildings. While soil flushing is a possible method of remediation, an effective chemical flushing agent has not been demonstrated for this site.

Compliance with ARARs - ARAR Compliance is dependent upon which alternative is being discussed as the ARARs vary with the type of remediation. Generally, ARARs relating to soil cleanup standards are not applicable as the threat from soil is primary as a source of contamination found in drinking water, not a direct threat from the soils themselves. One primary ARAR is the so called "land ban" restricting the land disposal of hazardous wastes without prior treatment to specified levels. The soil aeration, stabilization, and offsite disposal options would have to meet the standards for the solvents and metals contained in the soils removed and treated. The land ban regulations would not apply to the in situ options.

The ARARs for the groundwater treatment options would primarily be those involving levels of contamination which require treatment and those involving release of the water after treatment. As both of the treatment options call for reinjection of the treated water these would primarily be the maximum contaminant limits (MCLs) from the Safe Drinking Water Act and the NMWQCC regulations for discharge to the ground. A more complete list of ARARs can be found in Attachment 4.

Overall Protection of Human Health and the Environment - The no action alternative does not address present or potential public health or environmental concerns. The object is to prevent exposure to the site contaminants. This can best be accomplished through permanent destruction of the contaminants. The offsite disposal, stabilization and RCRA cover options do not do this. The incineration and soil aeration alternatives do offer permanent destruction, but present the possibility of escape of volatile contaminants during implementation. Soil flushing and vapor extraction provide for removal of the volatile contaminants from the soil and the subsequent permanent destruction of the volatile contaminants without the exposure to the public caused by the remedies requiring excavation.

State Acceptance - State preferences are expressed in Table One. In general the State prefers remedies which result in permanent solutions. Four of the alternatives (no action, landfilling, RCRA cover, and stabilization) do not satisfy this preference. Incineration would only satisfy it for organic contaminants and does not appear to be cost effective. Soil flushing would result in transferring contamination to groundwater prior to collection contrary to the State's policy of groundwater protection. Soil vapor extraction and aeration in the view of the State appear to be both cost effective and permanent solutions.

Community Acceptance - There has been little comment from the community on the soil remediation methods or about the selected method of groundwater treatment. Most of the public concerns have centered on the extent of groundwater remediation both in terms of depth and in the distance east of the property boundary at which groundwater would be recovered. The Responsiveness Summary found in Attachment 1 gives a more complete summary of public comment.

Cost - Table 2 shows comparative costs for each of the alternatives.

In addition to the discussion above a similar examination is necessary for groundwater remediation methods. All of the cleanup methods considered in the final analysis involved the use of groundwater extraction wells with treatment of contaminated water at the surface. This limits discussion of the alternatives to the effectiveness of the two treatment methods, air stripping and carbon adsorption. Both of these methods can be effective for treating volatile organic contaminants. However, not all of the contaminants are sufficiently volatile to be treated with air stripping alone. If air stripping is selected as the method for remediation a backup carbon adsorption step will be necessary. Carbon adsorption alone should be capable of removal of the contaminants, but as the lone method of remediation, it would have to be monitored carefully and the chance for breakthrough of contaminants would be increased.

Reproduced from best available copy.

TABLE ONE

ANALYSIS OF CRITERIA FOR SELECTION OF REMEDY FOR SOILS

	Short Term Effectiveness	Long Term Effectiveness	Reduction of Toxicity, Mobility or Volume	Implementability	Cost	ARARs	Overall Protectiveness of Human Health and the Environment	State Acceptance
No Action	-	-	-	+	+	-	-	-
Soil Vapor Extraction	+	+	+	+	o	+	+	+
Incineration	-	+	+	-	o	o	o	o
Soil Flushing	+	+	+	o	o	+	+	o
Aeration	-	+	+	-	o	o	o	+
Stabilization/ Fixation	-	-	o	-	o	o	-	o
RCRA Cover	o	-	o	o	o	+	-	-
Offsite Landfill	-	-	o	-	o	o	-	-

Favorable +
Neutral o
Unfavorable -

Note: All of the alternatives were rated as nuetral for Community Acceptance.

TABLE TWO

COMPARATIVE COSTS
FOR SOIL REMEDIATION ALTERNATIVES

OFFSITE DISPOSAL	$ 16,697,000
STABILIZATION	$ 5,309,320
RCRA COVER	$ 8,022,100
VACUUM EXTRACTION	$ 1,820,000
SOIL FLUSHING	$ 44,734,000
INCINERATION	$ 29,476,000
SOIL AERATION	$ 19,846,000

NOTE: Based on 36,000 cubic yards of material treated using costs from Appendix A, Volume VI, of the Remedial Investigation/Feasibility Study, Former Air Force Plant 83, August 1988.

Selected Remedy

The selected remedy for the site has two main portions, soil remediation and groundwater remediation. The method selected for soil remediation is soil vapor extraction for soils down to the water table. Effluent air from vapor extraction will have contaminants remov by a carbon adsorption system. The areas requiring soil remediation are shown in Figure 1 and 2. Two areas will need further definition of contamination prior to final selection of areas requiring remediation. These are on the northern property boundary where contamination extends off of the property north of Hazardous Waste Storage Area #4 and on the southern boundary of the property where contamination may extend south off of the property near Hazardous Waste Storage Area #1. For groundwater remediation the selected remedy is extraction of contaminated groundwater and treatment with air stripping followed by carbon adsorption. Carbon from both the water and air treatment systems will be regenerated offsite. Once treatment is completed, the treated water will be reinjected into the aquifer. For groundwater containing metals above background levels and exceeding applicable or relevant and appropriate regulations, appropriate physical and chemical treatment methods must be applied prior to reinjection of the treated water to reduce the level of metals to the levels required by State and Federal regulations.

The precise location of extraction wells will be determined during remedial design, but separate extraction systems will be required for shallow groundwater and for the deeper zone. The extraction systems must recover the contaminated groundwater in the shallow aquifer at both the northern and southern ends of the property, and must in the intermediate zone be sufficient to capture the contaminated groundwater indicated in Figure 4 to a depth of at least 160 feet. Should sampling of the intermediate wells beneath the Chevron property during remedial design show contaminant levels requiring active remediation the area of such remediation may be extended further to the east. Two areas will require further definition of groundwater contamination during remedial design through installation and sampling of additional monitoring wells. These are the extent of shallow zone contamination north of the property and, should the clay aquitard be discovered to be absent during this investigation, the extent of contamination in the deeper zones as well, and the eastward depth and extent of contamination downgradient of monitoring well DMW 2 below the shallow zone. Coordination of the groundwater recovery system selected within this document with other remedial activities will be an important function of the system design and the party implementing the selected remedy is required to provide a representative in discussions to promote such coordination.

Soils treatment will continue until the vapor extraction system ceases to produce volatile contaminants and will be followed by sampling to confirm soil remediation. Water extraction will continue until the levels of contaminants in the water fall below State and Federal regulatory standards.

Statutory Determinations

The selected remedy is protective of human health and the environment through the elimination of present and future risks posed by the site. The elimination of the volatile organic contaminants present in the site soils in the areas of Hazardous Waste Storage Areas 1, 3 and 4 and the recovery and treatment of contaminated groundwater under and near the site will result in the elimination of the current threat from the site. Future risks from the site will also be reduced through the same methods described above.

The selected remedy for soils invokes few ARARS as it will be done in situ and will create no unacceptable short-term risks during its construction and impoementation. Because of this the soil remedy does not have any requirements under regulations governing the handling or disposal of solid or hazardous wastes which it has to meet. The level of treatment in the selected remedy for groundwater does meet the standards for water set by maximum contaminant limits under the Safe Drinking Water Act and for discharge to the ground under NMWQCC regulations. As the treated water will be reinjected there are no requirements for discharge to be met other than those already mentioned.

The selected remedy is cost-effective when its components are compared to the other alternatives evaluated.

The selected remedy was picked from among the alternatives evaluated by the nine criteria as discussed in the section entitled Comparative Analysis of Alternatives. The selected remedy provides for the removal of organic contaminants which are serving as a source for the contamination found in the groundwater. The method selected is effective in both the short and long-term as it minimizes potential exposure to volatile contaminants during remediation while providing for permanent destruction of the contaminants so removed. The technologies selected for the removal of contaminants from site soils and from the groundwater treated as part of the selected remedy provide for the permanent destruction of the organic contaminants removed through regeneration of the carbon used for collection, thereby reducing their mobility, toxicity and volume and meeting the preference for treatment as a principle element of the selected remedy.

Responsiveness Summary

The responsiveness summary for this site can be found in Attachment 3.

ATTACHMENT ONE

STATE OF NEW MEXICO RESPONSE

TO RECORD OF DECISION

NEW MEXICO
HEALTH AND ENVIRONMENT
DEPARTMENT

Post Office Box 968
Santa Fe, New Mexico 87504-0968

ENVIRONMENTAL IMPROVEMENT DIVISION

Richard Mitzelfelt
Director

GARREY CARRUTHERS
Governor
Carla Muth
Secretary
Michael J. Burkhart
Deputy Secretary

September 30, 1988

Mr. Allyn Davis, Director (6H)
Hazardous Waste Management Division
U.S. Environmental Protection Agency
Region VI
1445 Ross Avenue
Dallas, Texas 75202-2733

Dear Mr. Davis:

EID concurs with the remedy outlined in the draft Record of Decision for the GE/USAF Operable Unit of the San Jose Superfund site. While this remedy alone does not address all potential threats to public health at the San Jose site it is an important part of the overall strategy to do so. The Design Review Committee, to include representatives of affected agencies and PRPs at the site, will ensure that this and other remedies are coordinated to achieve site cleanup.

Sincerely,

Richard Mitzelfelt
Director

EQUAL OPPORTUNITY EMPLOYER

ATTACHMENT TWO

ADMINISTRATIVE RECORD INDEX

Not included.

ATTACHMENT THREE

RESPONSIVENESS SUMMARY

FORMER AIR FORCE PLANT 83/GENERAL ELECTRIC
SOUTH VALLEY SUPERFUND SITE
COMMUNITY RELATIONS RESPONSIVENESS SUMMARY

This Community Relations Responsiveness Summary has been prepared to provide written responses to comments submitted regarding the proposed plan of action at Former Air Force Plant 83/General Electric, South Valley hazardous waste site. The summary is divided into two sections:

Section I: Background of Community Involvement and Concerns. This section provides a brief history of community interest and concerns raised during the remedial planning activities at South Valley.

Section II: Summary of Major Comments Received. The comments (both oral and written) are summarized and EPA's responses are provided.

I. Background of Community Involvement

Due to the possibility of contamination of the San Jose Wellfield, the South Valley site has received extensive media attention. However, because of the heavily industrialized nature of the site area and the lack of exposure, citizen concern was, until recently, very limited.

During 1988, specific interest in the site increased and numerous news articles as well as editorials appeared in the daily press. Citizen awareness and concern for the site conditions peaked during the public meeting on the San Jose Well #6 operable unit.

Although no citizen groups have been formed to deal specifically with the problems posed by the South Valley site, several groups have expressed a keen interest in the overall environment in the Albuquerque area.

II. Summary of Major Comments Received

The press release and Proposed Plan fact sheet announcing the public comment period and public meeting were distributed on August 23, 1988. The public comment period was extended from the originally announced closing date of September 16 to September 23, 1988 when the Air Force failed to submit the feasibility study to the repositories on time. A public work shop was held September 1, 1988 to discuss the results of the remedial investigation and the proposed plan for cleanup and was followed by a formal public meeting on September 13, 1988. Approximately 45 people from the area attended the formal meeting, and 13 individuals made oral statements or asked questions. Written comments were also submitted by two of the attendees.

No comments were received relating to soil remediation or method of groundwater treatment. Most of the comments received instead concentrated on the areal extent of groundwater remediation. During the public comment period, there were comments/questions regarding the following:

Comment 1: Additional monitoring is needed to determine the extent of groundwater contamination to the north of General Electric.

Response: The proposed plan calls for additional monitoring north of the General Electric property to determine the northern extent of contamination in the shallow groundwater zone.

Comment 2: Additional monitoring is needed to determine the extent of groundwater contamination northeast of the entire South Valley site.

Response: This comment lies outside the scope of this operable unit and is instead a part of the SJ-6 operable unit. A response to this comment is made in the Responsiveness Summary for that operable unit. Groundwater monitoring is planned for the area northeast of the site as part of the selected alternative for the SJ-6 operable unit.

Comment 3: Remedy selection at the General Electric property is premature as there is insufficient information on extent of groundwater contamination.

Response: 31 monitoring wells have been installed on the General Electric property and multiple rounds of sampling have been done. In addition, information from investigations conducted by other parties on other nearby properties as well as from the investigation conducted by EPA on adjacent property is available. While the desire for additional information remains, as is indicated by the additional groundwater monitoring required by the selected remedy, sufficient information is available to select a remedy.

Comment 4: The comment period for the proposed plan should be extended as the time for review and comment was not long enough.

A press release on the proposed plan and the proposed plan itself were released on August 23, 1988, a month before the close of the public comment period on September 23, 1988. The Remedial Investigation report had been placed in the three public repositories the preceeding week. As stated in Section II of the introduction to this responsiveness summary, the Air Force was late in submitting the feasibility study and it did not become available in the repositories until September 1, 1988. This was still three weeks prior to the close of public comment. A public workshop was held on September 1, 1988, to explain the proposed plan and a public meeting was held on September 13, 1988 to receive public comment. EPA believes that adequate time and opportunity was allowed for public comment.

Comment 5: Additional details are needed on the proposed plan.

A letter containing additional details of the proposed plan was sent to all who requested them on September 19, 1988. It should be noted that many of the requests for details on the proposed plan are not available at this time. The proposed plan is only a conceptual remedy. The more specific details of the remedy will developed during the remedial design which follows remedy selection.

Comment 6: If there is no danger posed by site soils, why are you [EPA] spending money to clean them up?

While the soils themselves do not appear to pose a direct threat to human health through contact, ingestion or inhalation from contamination with organic chemicals, they may be serving as a source of contamination to the groundwater. It is to eliminate this source of contamination that soil remediation is required in the selected remedy.

Comment 7: Have laboratory studies [animal studies] been run using material from the site?

Response: No. The information on risk from the chemicals found on the site comes from research done outside this investigation.

Comment 8: The money spent on public meetings should instead be spent for local educational efforts.

Response: EPA is required by the law under which the Superfund program operates to hold a public meeting at or near the location of the site regarding a proposed plan if there is sufficient interest in the site to warrant such a meeting. The law does provide for technical assistance grants to aid a citizens group who may be effected by a Superfund site.

Comment 9: Information provided to the public should be bi-lingual.

Response: This was the first such request received for this site. Arrangements will be made for Spanish translation of future materials.

Comment 10: Is EPA going to clean up the site or force the Air Force to?

Response: All of the potentially responsible parties for the site will receive notice letters asking for performance of the selected remedy once remedy selection has been made. Following receipt the Superfund law mandates a 120 day moratorium on any Superfund activities at the site. If agreement with potentially responsible parties can be reached during this moratorium, a legally binding agreement will be signed by EPA and the Respondent

for implementation of the selected remedy. Should no agreement be reached during the special notice moratorium, EPA has the options of pursuit of implementation of the selected remedy through litigation under the Superfund law or use of funds from the trust fund established by the Superfund law followed by recovery of costs through litigation. The decision on which optio to pursue will be dependent on conditions following the moratorium period.

Comment 11: EPA should use community groups to distribute information or develop a local advisory committee to disperse information.

Response: EPA is open to any suggestions on how information might be more effectively distributed. Information relating to this site is available locally at the Main Branch of the Albuquerque Public Library, the City/County Building, and the library at the University of New Mexico.

Comment 12: The feasibility study did not arrive on time (prior to the September 1, 1988 meeting). Reports are needed earlier.

Response: The Air Force did not submit the feasibility study report on time. This is why the September 1, 1988 meeting was not the official public meeting for the site. While EPA felt an obligation to be present at the previously announced date, September 1, 1988, we did not believe it fair to hold the official public meeting with so little time available for review of the feasibility study. This is why EPA came to Albuquerque a second time, September 13, 1988, to hold the official public meeting.

Comment 13: Was the sampling data from the Lente and Jaramillo wells considered?

Response: The information from the Lente and Jaramillo wells available at the time of the preparation of the Air Force report was considered and can be found on pages 104 and 105 of Volume VI of the Remedial Investigation and Feasibility Study report. EPA is aware of the detection of contaminants in these two wells. The Record of Decision for SJ-6 does include the installation of additional monitoring wells in the area where these wells are located. Present information indicates that the contaminants in the wells are below the standards for the individual contaminants and exceed the New Mexico criteria for combined carcinogenic effects in only the Jaramaillo well which is not a drinking water source.

Comment 14: Lack of additional groundwater quality data from offsite areas northwest of the site make interpretation of the 1985 and 1988 data difficult.

Response: This comment is correct insofar as additional groundwater monitoring is needed north of the property to further define contamination north of the property and to give additional information on groundwater flow directions. Such additional monitoring is called for in the proposed plan. However, sufficient information does exist on the presence and type of contamination to determine that groundwater remediation in the shallow groundwater zone at the north end of the property is necessary. The decrease in concentrations of contaminants between the 1985 sampling and the 1988 sampling were not sufficient to eliminate the need for remediation. The problem of the change in metals content of the samples taken in different sampling events is more troublesome, but can be resolved with resampling during remedial design.

Comment 15: Vertical migration of contaminants from the shallow groundwater zone to the intermediate and from the intermediate to the deep zones is clearly not understood.

Response: While not excluding the possibility of migration through other routes, it appears that much of the vertical migration from the shallow to the intermediate zone in this area is through the area where the clay aquitard is absent. Another possibility is migration down boreholes as mentioned in the SJ-6 proposed plan. It should be noted that three of the boreholes given in EPA's SJ-6 report as potential routes of contaminant migration are on the General Electric property. These are the two water wells associated with the water towers at the General Electric property and an abandoned well B1 that is located on the east side of the property south of Woodward Road.

As for contamination in the deep zone, sample data shows contamination beneath the GE property extending below 140 feet in only one well, DMW-2. This is immediatly downgradient of the area in which the aquitard between the shallow and intermediate zones is missing. As there is no barrier to migration between the shallow and intermediate zones this would seem to be direct vertical movement.

Comment 16: Data show a clear plume of volatile organic compounds emanating from the north end of the site toward the private wells to the east. Flatness of the shallow aquifer water table may not limit flow to a southerly direction through the site; some contamination in the shallow zone at the north end of the property may be migrating into the intermediate zone and travelling east-northeast.

Response: Groundwater flow in the far northern part of the property may not conform completely to the southerly flow seen in the other parts of the property. However, examination of shallow monitoring well analytical results, particularly wells SMW

13, SMW-14 and SMW-18, does not support there being an easterly component to contaminant migration. As for northerly flow the response to comment #1 explains that additional monitoring to the north of the property is required by the Record of Decision.

Comment 17: Volatile organic compounds from the shallow zone are [found] in the intermediate zone and "certainly evidence shows that they [VOCs found in the shallow zone] are in the deep zone."

Response: It is the migration of shallow contaminants to the intermediate zone which requires the remediation of the shallow zone. Further discussion of the routes of migration can be found in the response to Comment 15. The only evidence of deep contamination was in well DMW-2 at 140 to 160 feet in depth. This contamination is immediatly downgradient of the southern end of General Electric and remediation as well as further monitoring in this area is part of the selected remedy.

Comment 18: The City of Albuquerque has determined that 25 residences in the area do not receive bills from the City Water Department.

Response: EPA looks forward to receiving the results of the City's inquiries into the source of drinking water for these residences and will take those results into account when planning additional sampling and monitoring.

Comment 19: Analysis of health risks must take into account the full extent of the contaminant plume and the possible synergistic effects of combinations of VOCs that individually are below drinking water standards or remedial criteria as per NMWQCC Regulation Section 3-103. This generic standard must be incorporated into the list of ARARs.

Response: The New Mexico regulation regarding the additive effects of "toxic pollutant"s as defined by the NMWQCC regulations was taken into account and the quoted regulation was among those considered as part of the ARARs list.

Comment 20: Remedial actions should bring toxic pollutants to below regulatory levels to insure that contaminant levels will not exceed drinking water standards in future years.

Response: The selected remedy will require treatment of the extracted groundwater to levels required by State and Federal standards, including the "toxic pollutant" criteria mentioned the response to comment #19, where this is technologically feasible.

Comment 21: EPA has a statutory responsibility to permanently reduce contamination throughout the aquifer, not just in part of it.

Response: The intent of the combined activities of EPA in the South Valley Superfund site area is to provide protection for all of those who are effected by contamination in the aquifer originating from this site. The effort to eliminate contaminant sources, limit further migration from one groundwater zone to another, to recover and treat contaminated groundwater and to provide for a substitute source of drinking water for the lost City of Albuquerque water well provides for such protection both short and long-term.

Comment 22: The decisions on the operable units are being made in the wrong order; the decision on the GE site should be made first, then the decision on the SJ-6 operable unit.

Response: Each of the operable units of the South Valley site is part of a greater whole. However, the decisions on the SJ-6 operable unit and on the Former Air Force Plant 83/General Electric operable unit are being made at the same time. This will allow full knowledge of what is contained in the GE decision when the SJ-6 decision is made. EPA believes that all concerns about contamination will be addressed through the combination of the remedies selected in the Records of Decision for the South Valley site. Any additional concern that the remedy selected as part of the General Electric Record of Decision might be changed during negotiations is without basis. Negotiations will be for implementation of the remedy already selected not on the remedy itself.

Comment 23: EPA is failing to meet its obligations under Sections 121 and 118 of CERCLA as indicated in the September 1, 1988 letter from the State of New Mexico to EPA.

Response: The referenced letter discusses the "strong preference for active remedial alternatives for contaminated water supplies in §118 and §121". Active remediation is proposed for both soils and groundwater.

Comment 24: Additional outreach and education of local residents is needed. The reports are too technical for the local residents.

Response: Two meetings were held in Albuquerque (September 1 and September 13, 1988) for discussion of the site investigation and the proposed plan. In addition, the Superfund Amendments and Reauthorization Act of 1986 added a provision which allows a citizens' group to hire an advisor using grant funds. One of the possible uses of a technical advisor would be to review data and documents and educate the citizens about the nature and extent of contamination as well as possible solutions. A public workshop on the grant program was held in Albuquerque on May 19,

1988, and announcements were mailed to all of the people on the mailing list for the South Valley site.

Comment 25: Why is EPA leaving the site and abandoning the local residents?

Response: EPA is neither leaving nor abandoning the local residents. An entire series of actions has been and will be taken to correct problems associated with the South Valley Superfund site. These include the remedial efforts proposed for the GE property, the replacement of well SJ-6 with Burton #4, planned cleanup actions at the Edmunds Street property, and the elimination of abandoned boreholes serving as conduits for contaminant migration. Nor are these short term activities. In particular, the groundwater cleanup efforts may be time consuming requiring many years of continued involvement by EPA. Monitoring will be done to assess the effectiveness of the remedy as it is implemented to judge its effectiveness and further action will be taken if necessary beyond that in the selected remedy. It is explicitly stated in the Records of Decision for SJ-6 and General Electric that there will be an official review of the remedies after five years.

Comment 26: There is not sufficient integration between various portions of the site.

Response: Though the site has been divided into portions for greater ease in handling the multiple problems at this site, EPA still considers South Valley to be a single Superfund site. Both of the project managers at EPA involved with the South Valley site work closely together to insure that the aspects of the project are integrated. This will be further demonstrated with the formation of a workgroup to coordinate design of the selected alternatives once final decisions are made on remediation.

Comment 27: How can benzene used as a solvent be distinguished from benzene from petroleum products?

Response: In areas where solvent contamination is found EPA does not try to make such a distinction. It is only in areas with known floating petroleum products that EPA attributes dissolved benzene to petroleum contamination.

Comment 28: The lateral and vertical extent of contamination is not known.

Response: The response to comments 1 and 2 relate to this comment. There are two areas where the selected remedy calls for additional monitoring to define lateral extent of contamination. However, these efforts involve only two portions of the contaminant boundaries. The lateral extent of most of the area requiring extraction and treatment of groundwater has been defined. As for vertical extent, only one well shows

contamination at the 160 foot depth and this well is in one of the areas in which additional monitoring is called for.

Comment 29: What about the contamination that appears in SJ-6 at a depth of 812 feet?

Response: This comment relates more directly to the SJ-6 selected remedy, but quoting from the Responsiveness Summary for that decision:

"SJ-6 was completed in 1963 and was near the end of its design life in 1981. Over this 20 year period, about 100 feet of sediment accumulated at the base of Well SJ-6. The cement seal from the surface to the gravel pack also decomposed, providing a rapid and direct conduit from the Intermediate Zone, where contaminant concentrations are highest, down the borehole of SJ-6. This problem was most serious when SJ-6 was in use because of the strong gradient that pumping this high volume municipal well created. It is most likely that contaminants in the Intermediate Zone were forcibly pulled from the sources towards SJ-6 during well use. While the gradient is still in the same direction due to municipal pumping, the wells are further away and do not have nearly the hydraulic influence on the site as SJ-6. This interpretation is supported by the decreasing contaminant concentrations in the vicinity of and in SJ-6. The sediment at the base of SJ-6, however, became contaminated during this period and is acting as a secondary source."

Comment 30: Exactly what monitoring to the north and east of the site will be performed?

Response: Exact placement of monitoring wells is a function of remedial design. Responses to comments 1 and 2 give the areas in which additional monitoring is expected to the north and east. No geographic limitation has been placed on additional monitoring in the shallow zone north of GE as defining the limit of groundwater needing remediation is the purpose of such monitoring.

Comment 31: SJ-6 "target zones" limited the response at GE to the shallow aquifer.

Response: The purpose of target zones was to define the extent of the SJ-6 remedial investigation and feasibility study as separated from the GE work, not as a definition of remediation. This is evident in both the depth of the work at GE which did investigate the shallow, intermediate and deep zones and for which actual remediation of both the shallow, intermediate and upper deep zones is indicated in the proposed plan and selected remedy for the GE property.

Comment 32: When will the additional monitoring north and east of the site be done, when will the results be available and who will do the work?

Response: The when and who portions of this question cannot be answered directly at this time. The answer depends on the response to the notice letters from EPA to those potentially responsible for the contamination. The law requires that whenever practicable EPA offer potentially responsible parties the opportunity to implement the selected remedy. The law also establishes a 120-day waiting period for negotiation between EPA and potentially responsible parties for implementation of the selected remedy. Once an agreement has been reached for performance of the work under the supervision of EPA, installation of the monitoring wells should follow within about one year for work performed during remedial design and within the following year for work performed as part of remedial action. The results will be available immediately upon the receipt by EPA of the final analysis of the samples.

Comment 33: Private water wells are not monitoring wells and should not be the only wells used for monitoring.

Response: Private water wells normally have only a limited usefulness as monitoring wells. Wells designed and installed for the purpose of groundwater monitoring will be used for gathering data in the areas in which additional monitoring is required. Private wells can and will be used to gather some information such as water level readings and as gross indicators of areas of possible contamination.

Comment 34: There needs to be a binding agreement between EPA and the Air Force on remediation at GE.

Response: EPA does not negotiate remedies, only their implementation. Remedies are always selected prior to the negotiation of implementation with a potentially responsible party. EPA will notify all potentially responsible parties not just the Air Force. For further detail see Comment 10.

Comment 35: The plume moving north and east of the South Valley site will result in loss of aquifer potential and public and private well supplies.

Response: This question relates more closely to the SJ-6 remedy, but EPA has agreed as part of that remedy and part of the one selected for GE to expand the monitoring well network that exists in the area north and east of the site. The remedies selected for the various portions of the South Valley site should prevent any further contamination of City or private wells. This does not mean that the time necessary for correction of contamination that may have been taking place over the past 40 years will be short.

Comment 36: The diagram of contamination in the intermediate groundwater zone [shown as part of the public meeting] does not reach SJ-6.

Response: No it does not. The diagram represents conditions in 1987 and 1988 not those from the period when SJ-6 was in use.

Comment 37: Risk for groundwater should be reevaluated based on the water actually being used.

Response: This is how the risk was calculated. All of the risk calculations were done assuming direct consumption of the contaminated water.

Comment 38: Please provide a written response to the comments.

Response: A written response is always provided to comments received during a comment period for remedy selection.

Comment 39: Why wasn't a comprehensive approach taken to this site with EPA using the Superfund to do all the work and then cost recovering against potentially responsible parties?

Response: The six industrial properties all had viable present or past owners and or operators at the time of the initiation of the Superfund investigation. These properties were also only suspected sources for contamination, not known sources. In cases where viable potentially responsible parties are available to do investigatory work, EPA attempts to require those potentially responsible for a problem to do the investigation and later to do cleanup in order to preserve the money in the Superfund for those sites where viable potentially responsible parties are not available. Superfund monies were used in areas outside the potential source properties.

Comment 40: Is it EPA's position that the water from SJ-6 is not polluted?

Response: No that is not EPA's position. Remediation of well SJ 6 has been proposed as part of the SJ-6 proposed plan.

Comment 41: Why are the documents available for review labeled draft documents?

Response: The documents will not be finalized until after the public, EPA and the New Mexico Environmental Improvement Division have had opportunity to provide final comments. In this way the documents can reflect issues raised during the public comment period.

Comment 42: Are private well owners going to be compensated [if their wells are plugged]?

Response: None of the selected remedies calls for plugging active private wells.

Comment 43: Property owners should be required to notify anyone who works within the plant about the possibility of soil contamination.

Response: General Electric is aware of the results of the investigation into its property and bears the responsibility of the safety of its employees.

Comment 44: Who is going to evaluate the impact of one of these actions on the others and has that person been appointed yet?

Response: Impact of one remediation effort on the others was considered during remedy selection. During design of these alternatives, a work group will be set up to coordinate the efforts of all of the groundwater remedial activities in the area of the South Valley site.

Comment 45: Additional monitoring under this proposed plan must determine the relationship between contaminated groundwater emanating from this property and the contamination detected in two private wells to the northeast and one municipal to the north.

Response: The combination of additional monitoring proposed as part of the selected remedy for the General Electric property and that in the SJ-6 Record of Decision should supply this information. For additional information see Comments 1, 2 and 32.

Comment 46: Chlorinated solvents which have been found in groundwater beneath the GE/USAF property may be present above State standards as far east as the central portion of the Chevron property. Before design of a groundwater extraction system is initiated, all intermediate and deep monitoring wells east of the GE/USAF property must be resampled. If the resulting data shows that these wells do not define the horizontal and vertical extent of contamination above standards, additional monitoring wells must be installed until the plume is defined. Only then can an effective remedy be designed and implemented.

Response: Contamination in the monitoring wells in the central portion of the Chevron property is below the standards for the individual chemicals. The NMWQCC regulation Section 3-103A requires that when more than one "toxic pollutant" as defined in NMWQCC Regulation 1-101.UU, is present that their combined risk above 1x10-5 be considered. The goal of Superfund action is to reduce contamination in the aquifer below this standard.

Contamination in these wells is already within the 10-5 order of magnitude. The degree to which contamination is above the 1x10-5 level is almost wholly dependent upon the concentration of 1,1 dichloroethene. As has already been stated, the concentration of this chemical is below its numerical standard. The proposed plan does call for cleanup of that area of the groundwater zone to a depth of 160 feet immediately upgradient of Chevron and east of General Electric. With the elimination of both the soil sources of the contamination and the more greatly contaminated water upgradient, any threat from the chloronated solvents now found in the central portion of the Chevron property should rapidly be eliminated. Monitoring will be performed during the remedial effort to judge its effectiveness and the remedy will be subject to the five year review mentioned in the response to Comment 25. If at the time of the review it is found that the remedial effort selected has not been effective in reducing contaminant levels under the Chevron property, then the remedy will be reevaluated and active treatment of the contamination in this area may be initiated. The remedy will also be reevaluated should the sampling during remedial design fail to confirm the eastern extent of groundwater requiring recovery and the area of groundwater recovery may be extended to the east.

ATTACHMENT FOUR

ANALYSIS OF APPLICABLE OR

RELEVANT AND APPROPRIATE STANDARDS

INITIAL SCREENING OF POTENTIAL FEDERAL CHEMICAL-SPECIFIC ARAR'S
SOUTH VALLEY SJ-6 SUPERFUND SITE

Requirement	Prerequisites	Citation	Description	Applicable/Relevant and Appropriate	Comments
Safe Drinking Water Act (SDWA)		42 USC 300f			
National Primary Drinking Water Standards	Public Water System	40 CFR 141	Establishes health-based standards for public water systems [maximum contaminant levels (MCLs)].	Yes/--	Organic and inorganic contaminants have been detected at the study area.
National Secondary Drinking Water Standards	Public Water System	40 CFR 143	Establishes standards for the aesthetic qualities of public water systems [secondary MCLs (SMCLs)].	No/Yes	SMCLs are not federally enforceable but are intended as guidelines for the states.
Maximum Contaminant Level Goals	Public Water System	Public Law No. 99-339 100 Stat. 642 (1986)	Establishes maximum contaminant level goals (MCLGs) of no known or anticipated adverse health effects.	No/No	MCLGs are non enforceable requirements.
Clean Water Act (CWA)	Waters of the United States	33 USC 1251-1376	Objectives are to restore and maintain the chemical, physical, and biological integrity of the nation's waters.	No/No	There are no bodies of surface water on the site. (There are some man made drains; do not constitute bodies of surface water.
Water Quality Criteria		40 CFR 131			
Clean Air Act (CAA)					
National Primary and Secondary Ambient Air Quality Standards	Contamination of air affecting public health and welfare	40 CFR 50 42 USC 7401-7642)	Establishes standards for ambient air quality to protect public health and welfare (including standards for particulate matter and lead).	No/Yes	Air contamination is not anticipated to be a public health problem at this site.
Resource Conservation and Recovery Act (RCRA)	Uppermost aquifer underlying a waste management unit beyond the point of compliance	40 CFR 264.94	Owners/operators of RCRA treatment, storage, or disposal facilities must comply with conditions in the facility permit that are designed to ensure that hazardous constituents entering the groundwater from a regulated unit do not exceed the concentration limits under 264.94 in the uppermost aquifer underlying the waste management area beyond the point of compliance.	No/Yes	Conditions onsite are similar enough to these requirements to render them relevant and appropriate.

Note: -- = If a requirement is applicable, it cannot also be relevant and appropriate.

SFB159/1-1

INITIAL SCREENING OF POTENTIAL FEDERAL LOCATION-SPECIFIC ARAR'S
SOUTH VALLEY SJ-6 SUPERFUND SITE

Requirement	Prerequisites	Citation	Description	Applicable/Relevant and Appropriate	Comments
Resource Conservation and Recovery Act (RCRA)	RCRA hazardous waste, treatment, storage, or disposal	40 CFR 264.18(a)	New treatment, storage, or disposal of hazardous waste prohibited within 61 meters of a fault displaced in Holocene time.	No/No	There are no known faults within 61 meters.
RCRA	RCRA hazardous waste, treatment, storage, or disposal	40 CFR 264.18(b)	Treatment, storage, or disposal facilities within the 100-year flood plain must be designed, constructed, operated, and maintained to prevent washout.	No/No	The site is not within the 100-year flood plain.
Executive Order on Flood Plains	Action that will occur in a flood plain (i.e., lowlands and relatively flat areas adjoining inland and coastal waters, and other flood-prone areas)	Executive Order 11988	Must take action to avoid or minimize potential harm to flood plains, and restore and preserve natural and beneficial values.	No/No	The site is not in a flood plain.
RCRA	Noncontainerized or bulk liquid hazardous waste	40 CFR 264.18(c)	The placement of any noncontainerized or bulk liquid hazardous waste in a salt dome formation, salt bed formation, underground mine, or cave is prohibited.	No/No	There are no salt dome formations, salt bed formations, underground mines, or caves onsite. Disposal in salt dome formations, mines, or caves is not contemplated for this project.
National Archaeological and Historical Preservation Act	Alteration of terrain that threatens significant scientific, prehistorical, historical, or archaeological data	[16 USC Section 469) 36 CFR 65	Must take action to recover and preserve artifacts.	No/No	There are no known scientific, prehistoric, historic, or archaeological artifacts onsite.
Fish and Wildlife Coordination Act	Diversion channeling or other activity that modifies a stream or river and affects fish or wildlife	[16 USC 661 et. seq.] 40 CFR 6.302	Must take action to protect fish or wildlife	No/No	There are no streams, rivers, or water bodies onsite.
Scenic Rivers Act	Activities that affect or may affect any of the rivers specified in Section 1276(a)	[16 USC 1271 et. seq. Section 7(a)] 40 CFR 6.302(e)	Must avoid taking or assisting in action that will have direct adverse affect on scenic river.	No/No	The nearest recreational river, the Rio Grande, is located approximately 1 mile west of the study area.

Note: -- = If a requirement is applicable, it cannot also be relevant and appropriate.

SFR159/1-2

(Continued)

Requirement	Prerequisites	Citation	Description	Applicable/Relevant and Appropriate	Comments
Coastal Zone Management Act	Activities affecting the coastal zone including lands thereunder and adjacent shorelands	(16 USC Section 1451 et. seq.)	Must conduct activities in a manner consistent with approved state management programs.	No/No	The study area is an inland site with no direct access to coastal lands.
Clean Water Act (CWA) Section 404	Oceans and waters of the United States	40 CFR, Subpart H	Action to dispose of dredge material into ocean waters is prohibited without a permit.	No/No	There are no bodies of surface water on the site.
Marine Protection Resources and Sanctuary Act, Section 103	Oceans and waters of the United States	(33 USC 1251-1376) 40 CFR 230, 231	Action to dispose of dredge material into ocean waters is prohibited without a permit.	No/No	There are no bodies of surface water on the site.
Historic Sites, Buildings, and Antiquities Act	Existence of natural landmarks	(16 USC 461-467)	Must avoid undesirable impacts upon landmarks.	No/No	There are no landmarks on the National Register of Natural Landmarks on the site.
Rivers and Harbors Act	Activities affecting navigation waters	(33 CFR 320-330) 33 USC 403	Substative requirements of Section 10 must be met if an alternative developed would involve structures or work in or affect navigable waters.	No/No	There are no navigable waters onsite.
National Historic Preservation Act, Section 106	Property included in or eligible for the National Register for Historic Places	(16 USC 470 et. seq.) 36 CFR 800	Must take action to preserve historic properties owned or controlled by federal agency. Must plan action to minimize harm to National Historic landmarks.	No/No	The site is not included in or eligible for the National Register of Historic Places.
Endangered Species Act of 1973	Critical habitat upon which endangered species or threatened species depends	(16 USC 1531 et. seq.) 50 CFR 200, 50 CFR 402	Must take action to conserve endangered species or threatened species.	No/No	The site is not a critical habitat upon which endangered species or threatened species depend.
Executive Order on Protection of Wetlands	Wetland as defined by Executive Order 11990, Section 7	Executive Order 11990 40 CFR Appendix 6	Must take action to minimize the destruction, loss, or degradation of wetlands.	No/No	The site is not a wetland as defined by Executive Order 11990, Section 7.

Note: -- = If a requirement is applicable, it cannot also be relevant and appropriate.

SFR159/1-3

(continued)

Requirement	Prerequisites	Citation	Description	Applicable/Relevant and Appropriate	Comments
Wilderness Act	Federally owned area described as a wilderness area	50 CFR 35.1 et. seq.	Area must be administered in such a manner that will leave it unimpaired as wilderness and to preserve its wilderness character.	No/No	The site is not a federally owned area described as a wilderness area.
National Wildlife Refuge System	Area designated as part of the National Wildlife Refuge System	50 CFR Part 27, (16 USC 668 d.d. et. seq.)	Only actions that are allowed under the provisions of 16 USC, Section dd(c) may be undertaken in areas that are part of the National Wildlife Refuge System.	No/No	The site is not designated as part of the National Wildlife Refuge System.

Note: -- = If a requirement is applicable, it cannot also be relevant and appropriate.

SFR159/1-4

INITIAL SCREENING OF POTENTIAL FEDERAL ACTION-SPECIFIC ARARs
SOUTH VALLEY SJ-6 SUPERFUND SITE

Requirement	Prerequisites	Citation	Description	Applicable/Relevant and Appropriate	Comments
Solid Waste Disposal Act		(42 USC 6901-6987)			
Criteria for Classification of Solid Waste Disposal Facilities and Practices	Disposal of solid waste	40 CFR 257	Establishes criteria for use in determining which solid waste disposal facilities and practices pose a reasonable probability of adverse effects on health or the environment and, thereby, constitute prohibited open dumps.	No/Yes	However, the more stringent provisions of 40 CFR 260 supercede these criteria.
Hazardous Waste Management System: General	RCRA hazardous waste	40 CFR 260	Establishes procedures and criteria for modification or revocation of any provision in 40 CFR 260-265.	No/No	No modifications or revocations are needed; existing regulations will be used.
Identification and Listing of Hazardous Waste	Solid waste	40 CFR 261	Defines those solid wastes that are subject to regulation as hazardous wastes under 40 CFR 262-265, and 124, 270, and 271.	No/Yes	Are relevant and appropriate if any solid waste residues are generated as a result of treatment.
Standards Applicable to Generators of Hazardous Waste	Generation of RCRA hazardous waste	40 CFR 262	Establishes standards for generators of hazardous waste.	No/Yes	Are relevant and appropriate if there is hazardous solid or liquid residues from treatment plant.
Standards Applicable to Transporters of Hazardous Waste	Generation of RCRA hazard waste with offsite disposal	40 CFR 263	Establishes standards that apply to persons transporting hazardous waste within the U.S. if the transportation requires a manifest under 40 CFR 262.	Yes/--	Applicable if disposal of hazardous waste residues associated with treatment must be transported offsite.
Standards Applicable to Owners/Operators of Hazardous Waste Treatment, Storage and Disposal Facilities	RCRA hazardous waste	40 CFR 264	Establishes minimum national standards that define the acceptable management of hazardous waste for owners and operators of facilities that treat, store, or dispose of hazardous waste.	Yes/--	Applicable to treatment facility.
o General Facility Standards	Treatment, storage, or disposal of RCRA hazardous waste onsite	Subpart B	N/A	No/Yes	Are relevant and appropriate for onsite treatment facility.
o Preparedness and Prevention	Generation or treatment, storage, or disposal of RCRA hazardous waste onsite	Subpart C	N/A	No/Yes	Treatment facility needs a properly developed and implemented plan for worker safety.
o Contingency Plan and Emergency Procedures	Generation or treatmet, storage, or disposal of RCRA hazardous waste onsite	Subpart D	N/A	No/Yes	Establishes normal safety plans and procedures.
o Manifest System Recordkeeping and Reporting	Generation or treatment, storage, or disposal of RCRA hazardous waste onsite	Subpart E	N/A	Yes/--	Are applicable if hazardous solid and liquid residues from treatment plant must be transported offsite.
o Releases from Solid Waste Management Units	Generation or treatment, storage, or disposal of RCRA hazardous waste onsite	Subpart F	N/A	No/Yes	Groundwater monitoring provisions are relevant and appropriate.
o Closure and Post-Closure	Generation or treatment, storage, or disposal of RCRA hazardous waste onsite	Subpart G	N/A	Yes/--	Portions of Subpart G that deal with post-closure activities are applicable.

Note: -- = If a requirement is applicable, it cannot also be relevant and appropriate.

(Continued)

Requirement	Prerequisites	Citation	Description	Applicable/Relevant and Appropriate	Comments
• Financial Requirements	Generation or treatment, storage, or disposal of RCRA hazardous waste onsite	Subpart H	N/A	Yes/--	
• Use and Management of Containers	Management of RCRA hazardous waste in containers	Subpart I	N/A	Yes/--	Applicable for any containerized waste generated as a result of remedial construction.
• Tanks	Management of RCRA hazardous waste in tanks onsite	Subpart J	N/A	Yes/--	Same as Subpart I.
• Surface Impoundments	Management of RCRA hazardous waste in surface impoundments onsite	Subpart K	N/A	No/No	Surface impoundments are not being proposed for use at this site.
• Waste Piles	Management of RCRA hazardous waste in waste piles onsite	Subpart L	N/A	No/No	Waste piles are not being used at this site.
• Land Treatment	Land treatment of RCRA hazardous waste onsite	Subpart M	N/A	No/No	Land treatment is not being proposed for use at this site.
• Landfills	Landfilling of RCRA hazardous waste onsite	Subpart N	N/A	No/No	Onsite landfills are not being proposed at this site.
• Incinerators	Incineration of RCRA hazardous waste onsite	Subpart O	N/A	No/No	Onsite incineration is not being proposed as part of this study.
• Miscellaneous Units	Treatment, storage, or disposal of miscellaneous units	Subpart X		No/No	None are identified at this site.
Interim Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities		40 CFR 265	Establishes minimum national standards that define the acceptable management of hazardous waste during the period of interim status and until certification of final closure or, if the facility is subject to postclosure requirements, until postclosure responsibilities are fulfilled.	No/No	This is not an interim-status facility.
Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities	Recyclable materials that are reclaimed to recover precious metals	40 CFR 266	Establishes requirements that apply to recyclable materials that are reclaimed to recover economically significant amounts of precious metals.	No/No	This is not a recycling facility to recover precious metals.
Interim Standards for Owners and Operators of New Hazardous Waste Land Disposal Facilities	New RCRA hazardous waste land disposal facility	40 CFR 267	Establishes minimum national standards that define acceptable management of hazardous waste for new land disposal facilities. Also establishes standards for underground injection of hazardous wastes.	No/No	A new hazardous waste land disposal facility is not being proposed. Underground injection of hazardous wastes is not contemplated.
Land Disposal Restrictions	Land disposal of RCRA hazardous waste onsite or offsite	40 CFR 268	Prohibits land disposal of specified untreated hazardous wastes and provides special requirements for handling such wastes.	No/No	No untreated wastes are contemplated for disposal.
Hazardous Waste Permit Program	RCRA hazardous waste treatment, storage, and disposal onsite	40 CFR 270	Establishes provisions covering basic EPA permitting requirements.	No/No	Permits are not required for onsite activities at Superfund sites.

Note: If a requirement is applicable, it cannot also be relevant and appropriate.

(Continued)

Requirement	Prerequisites	Citation	Description	Applicable/Relevant and Appropriate	Comments
Underground Storage Tanks (UST)	Underground storage tank	40 CFR 280	Establishes regulations related to underground storage tanks.	No/No	There are no underground storage tanks that are being addressed in this study.
Proposed Regulation for Control of emissions of volatile organics	Volatile organics emissions	52 FR 3748	Proposed standard would require 95% reduction of volatile organic emissions from Product Accumulator Vessel.	Yes/--	If a treatment plant is a product accumulator vessel.
Safe Drinking Water Act (SDWA)		(42 USC 300g)			
Underground Injection Control Regulations (UIC)	Underground injection of substances	40 CFR 144-147	Provides for protection of underground sources of drinking water.	No/No	Some portions of 40 CFR 144 would apply to the construction and operation of reinjection wells that would be used to enhance groundwater restoration.
Clean Water Act (CWA)		33 USC 1251-1376			
National Pollutant Discharge Elimination System	Discharge of pollutants from any point source into waters of the United States	40 CFR 122, 125	Requires permits for the discharge of pollutants from any point source into waters of the United States. Permits based on ambient water quality criteria.	Yes/--	Technology-based treatment requirements that are equivalent to best conventional control technology (BCT) or best available technology economically available (BAT) will be determined by EPA on a site-specific basis.
Effluent Limitations	Point source discharge into the Ore Mining and Dressing Point Source category	40 CFR 440	Sets technology-based effluent limitations for point source discharges in the Ore Mining and Dressing Point Source category.	No/No	No ore sources have been identified at the site.
National Pretreatment Standards	Pollutants that pass through or interfere with treatment processes in POTWs or that may contaminate sewage sludge.	40 CFR 403	Sets standards to control pollutants that pass through or interfere with treatment processes in POTWs or that may contaminate sewage sludge.	No/No	Discharge to the City of Albuquerque Sewage Treatment Plant is not considered because the nearby plant does not have adequate capacity.
Toxic Pollutant Effluent Standards	Aldrin/dieldrin, DDT, endrin, toxaphene, benzidene, PCBs	40 CFR 129	Establishes effluent standards or prohibitions for certain toxic pollutants.	Yes/--	If these contaminants exist within the study area.
Marine Protection Research and Sanctuaries Act	Ocean dumping	(33 USC 1401-1445)	Regulates ocean dumping.	No/No	Ocean dumping not part of any proposed alternatives.
Toxic Substances Control Act (TSCA)	PCBs	(15 USC 2601-2629) 40 CFR 761	Establishes storage and disposal requirements for PCBs.	No/No	PCBs not detected within study area.
Surface Mining Control and Reclamation Act (SMCRA)	Mining operations	(30 USC 1201-1328)	Establishes provisions designed to protect the environment from the effects of surface coal mining operations and, to a lesser extent, noncoal mining.	No/No	Study area is not a mining-related site.
Clean Air Act (CAA)		(42 USC 7401-7642)			
National Emission Standard for Hazardous Air Pollutants	Hazardous air pollutants	40 CFR 61	Sets emission standards for designated hazardous pollutants, including mercury, beryllium, and inorganic arsenic.	No/Yes	Some portions of 40 CFR 61 would be relevant and appropriate to off-gas emissions from air strippers.

Note: * If a requirement is applicable, it cannot also be relevant and appropriate.

(Continued)

Requirement	Prerequisites	Citation	Description	Applicable/Relevant and Appropriate	Comments
National Ambient Air Quality Criteria	Various air contaminants		Sets emission standards for designated air contaminants to protect the public health and welfare.	Yes/--	All proposed alternatives need to provide adequate level of workers protection during remediation.
New Source Performance Standards	New stationary source		Sets emission standards for certain classes of new stationary sources of air pollution.	Yes/--	If a certain class of new source is proposed as part of treatment plant.
Occupational Safety and Health Act (OSHA)	Remedial action workers	(29 USC 651-678)	Regulates worker health and safety.		
Federal Mine Safety and Health Act	Work in underground mines	30 USC 801-962	Regulates working conditions in underground mines to assure safety and health of workers.	No/No	Study area is not a mining-related site.
Hazardous Materials Transportation Act		(44 USC 1801-1813)			
Hazardous Materials Transportation Regulations	Transportation of hazardous materials	40 CFR 107, 171-177	Regulates transportation of hazardous materials.	Yes/--	If any alternative requires the offsite transportation of hazardous materials.

Note: -- = If a requirement is applicable, it cannot also be relevant and appropriate.

INITIAL SCREENING OF POTENTIAL STATE CHEMICAL-SPECIFIC ARAR'S
SOUTH VALLEY SJ-6 SUPERFUND SITE

Requirement	Prerequisites	Citation	Description	Applicable/Relevant and Appropriate	Comments
New Mexico Water Quality Act	Surface and subsurface within or bordering upon New Mexico.	New Mexico Statutes, Title 74 Article 6	This law creates the Water Quality Control Commission, which has the duties and powers to set water quality standards.		
New Mexico Water Quality Regulations Toxic Pollutant Criteria	Water contaminants; groundwater of <10,000 TDS.	1.101.B.U.	Regulates toxic pollutants "which are water contaminants ... which upon ingestion or assimilation will unreasonably threaten to injure human health, or the health of animals or plants ...."	Yes/--	Sets treatment standards for groundwater.

Note: -- = If a requirement is applicable, it cannot also be relevant and appropriate.

SF0159/1-5

INITIAL SCREENING OF POTENTIAL STATE ACTION-SPECIFIC ARAR'S
SOUTH VALLEY SJ-6 SUPERFUND SITE

Requirement	Prerequisites	Citation	Description	Applicable/Relevant and Appropriate	Comments
New Mexico Water Quality Act	Surface and subsurface within or bordering upon New Mexico.	New Mexico Statutes, Title 74, Article 6	Creates the water quality control commission, which has the duties and powers to set water quality standards and to regulate effluent to surface and subsurface waters.		
New Mexico Water Quality Regulations					
o Toxic Pollutant Criteria	Water contaminant(s) groundwater of <10,000 TDS. Effluent discharge to groundwater.	1-101.U.U.	Regulates toxic pollutants "which are water contaminants ... which upon ingestion or assimilation ... will unreasonably threaten to injure human health, or the health of animals or plants ...."	Yes/--	ARAR for reinjection of groundwater.
o General Requirements	Effluent discharge to a water course.	2-101.A	Sets limitations on BOD, COD, settleable solids, fecal coliform bacteria, and pH.	No/No	No point discharge to a water course is proposed.
o Rio Grande Basin--Community Sewerage System Requirements	Discharge to a water course in the Rio Grande Basin between the headwaters of Elephant Butte Reservoir and Angostura Diversion Dam.	2-102.A	Sets limitations on BOD, COD, settleable solids, fecal coliform bacteria, and pH.	No/No	The site is within this stretch of the Rio Grande, but no point discharge to a water course is proposed.
o Regulations for Discharges onto or Below the Surface of the Ground	Discharge onto or below the surface of the ground.				
- Standards for Groundwater of 10,000 mg/l TDC Concentration or Less		3-103.A., B., C.	Sets human health standards, standards for domestic water supply, and standards for irrigation use for discharges to the groundwater.	Yes/--	ARAR for reinjection of groundwater.

Note: -- = If a requirement is applicable, it cannot also be relevant and appropriate.

SFB159/1-6

(continued)

Requirement	Prerequisites	Citation	Description	Applicable/Relevant and Appropriate	Comments
New Mexico Water Quality Standards	Surface waters of the State of New Mexico.		Designates uses for which the surface waters of New Mexico shall be protected and prescribes the water quality standards necessary to sustain the designated uses.		
o General Standards	Discharge of a toxic pollutant.	1-103	Outlines the requirements for discharges of toxic substances to surface waters suitable for recreation and support of desirable aquatic life presently common in New Mexico waters.	No/No	No point discharge to a water course is proposed.
o Stream Use Designation and Standards	Discharges to the main stem of the Rio Grande from the headwaters of Elephant Butte upstream to the Angostura Diversion work.	2-105	Sets standards for dissolved oxygen, pH, temperature, fecal coliform bacteria, TDS, sulfate, and chloride.	No/No	No point discharge to a water course is proposed.
New Mexico Air Quality Control Act					
New Mexico Air Quality Standards and Regulations	Discharge of particulates, sulfur dioxide, hydrogen sulfide, reduced sulfur, carbon monoxide, nitrogen dioxide, photochemical oxidants, and nonmethanol hydrocarbons to the air.	701	Sets standards for discharges of these criteria to the air.	Yes/--	ARAR for treatment effluent to the air.

Note: If a requirement is applicable, it cannot also be relevant and appropriate.

ATTACHMENT FIVE

SUMMARY OF ANALYTICAL RESULTS

SUMMARY OF ANALYTICAL RESULTS OF GROUNDWATER SAMPLES FROM WELLS IN THE SHALLOW WATER-BEARING ZONE

Parameter	Round 1 Number of Samples	Round 1 Number Positive IDs	Round 1 Sample Range Low	Round 1 Sample Range High	Round 1 Sample Mean	Round 2 Number of Samples	Round 2 Number Positive IDs	Round 2 Sample Range Low	Round 2 Sample Range High	Round 2 Sample Mean	Standard
Inorganics:											
Aluminum	24	1	BDL	610.00	610.00	24	19	BDL	5500.00*	721.58	5000 (d)
Arsenic	24	10	BDL	205.00*	136.50*	24	*****	ALL SAMPLES WERE BDL			50 (a)
Barium	24	23	BDL	600.00	87.17	24	24	20.00	180.00	76.25	1000 (a)
Beryllium	24	*****	ALL SAMPLES WERE BDL			24	1	BDL	10.00	10.00	-
Cadmium	24	19	BDL	50.00*	20.39*	24	14	BDL	70.00*	27.64*	10 (a)
Copper	24	5	BDL	480.00	152.00	24	17	BDL	870.00	157.06	1000 (c)
Iron	24	24	20.00	7000.00*	832.92	24	24	120.00	6100.00*	1100.00*	1000 (c)
Lead	24	*****	ALL SAMPLES WERE BDL			24	2	BDL	30.00	25.00	50 (a)
Magnesium	24	24	140.00	********	53549.58	24	24	19000.00	********	64041.67	-
Manganese	24	21	BDL	2200.00*	560.95*	24	24	90.00	2500.00*	606.25*	200 (c)
Mercury	24	1	BDL	3.00*	3.00*	24	*****	ALL SAMPLES WERE BDL			2 (a)
Nickel	24	2	BDL	30.00	22.50	24	*****	ALL SAMPLES WERE BDL			200 (d)
Selenium	24	18	BDL	600.00*	252.61*	24	5	BDL	68.00*	57.00*	10 (a)
Zinc	24	23	BDL	780.00	201.52	24	23	BDL	2300.00	367.39	10,000 (c)
Organics:											
Benzene	22	3	BDL	9.70*	4.07	23	*****	ALL SAMPLES WERE BDL			5 (a)
Chlorobenzene	22	*****	ALL SAMPLES WERE BDL			23	1	BDL	1.10	1.10	-
Ethylbenzene	22	1	BDL	0.80	0.80	23	*****	ALL SAMPLES WERE BDL			750 (b)
Dibromochloromethane	22	3	BDL	21.00	9.27	23	1	BDL	16.00	16.00	-
Chloroform	22	3	BDL	30.00	25.00	23	*****	ALL SAMPLES WERE BDL			100 (b)
Chloroethane	22	5	BDL	36.00	13.30	23	3	BDL	15.00	7.37	-
1,1-Dichloroethane	22	11	BDL	67.00	34.26	23	8	BDL	112.00	55.49	25 (b)
1,1-Dichloroethene	22	8	BDL	47.00*	30.44*	23	6	BDL	55.00*	26.67*	5 (b)
1,2-Dichloroethane	22	7	BDL	19.00*	10.37*	23	2	BDL	30.00*	20.50*	5 (a)
Trans-1,2-Dichloroethene	22	6	BDL	31.00	18.45	23	8	BDL	41.00	15.56	-
Trans-1,3-Dichloropropene	22	2	BDL	39.00	31.00	23	*****	ALL SAMPLES WERE BDL			-
1,1,1-Trichloroethane	22	10	BDL	61.00*	18.55	23	1	BDL	60.00	60.00	60 (b)
1,1,2,2-Tetrachloroethane	22	2	BDL	4.20	3.95	23	*****	ALL SAMPLES WERE BDL			-
Trichloroethene	22	8	BDL	28.00*	15.4*	23	7	BDL	64.00*	22.37*	5 (a)
Tetrachloroethylene	22	10	BDL	180.00*	31.79*	23	8	BDL	28.00*	16.40	20 (b)
Toluene	22	2	BDL	1.70	1.60	23	1	BDL	2.60	2.60	750 (b)
Methylene Chloride	22	1	BDL	57.00	57.00	23	*****	ALL SAMPLES WERE BDL			100 (b)
Trichlorofluoromethane	22	1	BDL	0.72	0.72	23	*****	ALL SAMPLES WERE BDL			-
Vinyl chloride	22	3	BDL	1.20*	0.79	23	3	BDL	2.60*	1.75*	1 (b)
2-Chloroethylvinylether	22	1	BDL	5.40	5.40	23	*****	ALL SAMPLES WERE BDL			-
Pyrene	22	1	BDL	14.00	14.00	23	*****	ALL SAMPLES WERE BDL			-
N-nitrosodiphenylamine	22	1	BDL	120.00	120.00	23	*****	ALL SAMPLES WERE BDL			-
Isophorone	22	4	BDL	940.00	351.60	23	*****	ALL SAMPLES WERE BDL			-
Butyl benzyl phthalate	22	1	BDL	18.00	18.00	23	*****	ALL SAMPLES WERE BDL			-
Total Petroleum Hydrocarbons	23	3	BDL	1.10	0.97	24	12	BDL	2.60	1.25	-

SUMMARY OF ANALYTICAL RESULTS OF GROUNDWATER SAMPLES FROM WELLS IN THE SHALLOW WATER-BEARING ZONE
(CONTINUED)

Footnotes:

1. All values in ug/l.
2. The sample mean is calculated only from the samples in which the parameter was detected, not the total number of samples.
3. BDL means Below Detection Limit.
4. Duplicate samples were averaged and considered as one value.
5. Round 1 samples collected between December 9-18, 1987; Round 2 samples collected between January 14-28, 1988.
6. This table includes results from the following wells: SMW-9 through SMW-19, SW-1 through SW-4, SW-6, SW-7, SW-8 (the screened interval of these wells ranges from 4903.7 ft to 4927.9 ft.), and S1, S2, S4, S5, S6, SV8 (the screened intervals of these wells are unknown, but the depths of these wells are 29.3 ft, 26 ft, 20.5 ft, 25 ft, 24.9 ft, and 25 ft, respectively), and SV9 (the screened interval and depth of this well are unknown, but it is known to be a shallow well).
7. Standards: (a) USEPA Safe Drinking Water Act Maximum Contaminant Level.
   (b) New Mexico Environmental Improvement Division (NMEID) human health standard for groundwater.
   (c) NMEID - other standards for domestic water supply.
   (d) NMEID - standards for irrigation use.

   If both New Mexico and Federal Standards were available, the lower concentration was selected as the applicable standard.
   *Exceeds Standard.

SUMMARY OF ANALYTICAL RESULTS OF GROUNDWATER SAMPLES FROM WELLS IN THE UPPER PORTION OF THE INTERMEDIATE AQUIFER

Parameter	Round 1 Number of Samples	Round 1 Number Positive IDs	Round 1 Sample Range Low	Round 1 Sample Range High	Round 1 Sample Mean	Round 2 Number of Samples	Round 2 Number Positive IDs	Round 2 Sample Range Low	Round 2 Sample Range High	Round 2 Sample Mean	Standard
Inorganics:											
Aluminum	13	1	BDL -	500.00	500.00	13	7	BDL -	1100.00	606.43	5000 (d)
Barium	13	13	40.00 -	220.00	80.00	13	12	BDL -	210.00	78.75	1000 (a)
Cadmium	13	11	BDL -	50.00*	24.73*	13	8	BDL -	50.00*	19.69*	10 (a)
Copper	13	10	BDL -	210.00	99.00	13	8	BDL -	930.00	209.38	1000 (c)
Iron	13	12	BDL -	630.00	249.17	13	12	BDL -	1100.00*	362.50	1000 (c)
Lead	13	1	BDL -	40.00	40.00	13	2	BDL -	210.00*	155.00*	50 (a)
Magnesium	13	13	800.00 -	22000.00	12853.85	13	13	14.00 -	21000.00	14112.62	-
Manganese	13	9	BDL -	25000.00*	2946.67*	13	11	BDL -	1300.00*	239.09*	200 (c)
Mercury	13	1	BDL -	12.00*	12.00*	13	*****	ALL SAMPLES WERE BDL *****			2 (a)
Selenium	13	9	BDL -	230.00*	133.33*	13	1	BDL -	51.00*	51.00*	10 (a)
Zinc	13	13	130.00 -	4000.00	547.69	13	13	40.00 -	1300.00	352.69	10,000 (c)
Organics:											
2-Chloroethylvinylether	13	1	BDL -	13.00	13.00	13	*****	ALL SAMPLES WERE BDL *****			-
1,1-Dichloroethane	13	3	BDL -	20.00	11.53	13	3	BDL -	41.00	18.63	25 (b)
1,1-Dichloroethene	13	3	BDL -	7.10*	3.61	13	2	BDL -	13.00*	10.25*	5 (b)
Trans-1,2-Dichloroethene	13	2	BDL -	14.00	9.70	13	2	BDL -	3.50	3.40	-
1,2-Dichloroethane	13	2	BDL -	2.80	2.10	13	1	BDL -	2.30	2.30	5 (a)
1,1,1-Trichloroethane	13	1	BDL -	9.20	9.20	13	*****	ALL SAMPLES WERE BDL *****			60 (b)
Tetrachloroethylene	13	1	BDL -	13.00	13.00	13	2	BDL -	21.00*	14.0	20 (b)
Trichloroethene	13	2	BDL -	0.56	0.44	13	1	BDL -	7.80*	7.80*	5 (a)
Toluene	13	2	BDL -	10.30	5.80	13	*****	ALL SAMPLES WERE BDL *****			750 (b)
Pyrene	13	1	BDL -	15.00	15.00	13	*****	ALL SAMPLES WERE BDL *****			-
Isophorone	13	5	BDL -	450.00	206.00	13	*****	ALL SAMPLES WERE BDL *****			-
Total Petroleum Hydrocarbons	12	1	BDL -	0.55	0.55	13	11	BDL -	2.65	1.20	-

Footnotes:

1. All values in ug/l.
2. The sample mean is calculated only from the samples in which the parameter was detected, not the total number of samples.
3. BDL means Below Detection Limit.
4. Duplicate samples were averaged and considered as one value.
5. Round 1 samples collected between December 9-18, 1987; Round 2 samples collected between January 14-28, 1988.
6. This table includes results from the following wells: IMW-4, IMW-5, IMW-6, DMA-1, DMA-2, DMB-1, DMB-2, DMB-3 (the screened interval of these wells ranges from 4858.45 ft to 4903.83 ft.), and I5, I7, I8, I9 and HL4 (the screened intervals of these wells is unknown, but the depths of these wells are 78 ft, 87 ft, 88.7 ft, 56.4 ft and 72ft, respectively).
7. Standards: (a) USEPA Safe Drinking Water Act Maximum Contaminant Level.
   (b) New Mexico Environmental Improvement Division (NMEID) human health standard for groundwater.
   (c) NMEID - other standards for domestic water supply.
   (d) NMEID - standards for irrigation use.

   If both New Mexico and Federal Standards were available, the lower concentration was selected as the applicable standard.

* Exceeds Standard.

SUMMARY OF ANALYTICAL RESULTS OF GROUNDWATER SAMPLES FROM WELLS IN THE LOWER PORTION OF THE INTERMEDIATE AQUIFER

Parameter	Round 1 Number of Samples	Round 1 Number Positive IDs	Round 1 Sample Range Low	Round 1 Sample Range High	Round 1 Sample Mean	Round 2 Number of Samples	Round 2 Number Positive IDs	Round 2 Sample Range Low	Round 2 Sample Range High	Round 2 Sample Mean	Standard
Inorganics:											
Aluminum	6	*****	ALL SAMPLES WERE BDL	*****		6	4	BDL -	430.00	385.00	5000 (a)
Barium	6	6	40.00 -	140.00	76.67	6	6	30.00 -	120.00	68.33	1000 (a)
Cadmium	6	3	BDL -	25.00*	22.50*	6	2	BDL -	10.00	7.50	10 (a)
Copper	6	3	BDL -	100.00	75.00	6	5	BDL -	200.00	116.00	1000 (c)
Iron	6	5	BDL -	120.00	96.00	6	6	80.00 -	120.00	100.00	1000 (c)
Lead	6	*****	ALL SAMPLES WERE BDL	*****		6	1	BDL -	20.00	20.00	50 (a)
Magnesium	6	6	130.00 -	17000.00	11688.33	6	6	12000.00 -	17000.00	14500.00	-
Manganese	6	6	10.00 -	50.00	25.83	6	6	10.00 -	440.00*	101.67	200 (c)
Selenium	6	5	BDL -	210.00*	116.00*	6	*****	ALL SAMPLES WERE BDL	*****		10 (a)
Zinc	6	6	130.00 -	290.00	176.67	6	6	50.00 -	480.00	208.33	10,000 (c)
Organics:											
Chloroform	5	*****	ALL SAMPLES WERE BDL	*****		6	1	BDL -	170.00*	170.00*	100 (b)
1,1-Dichloroethane	5	2	BDL -	36.00	19.25	6	1	BDL -	30.00	30.00	25 (b)
1,1-Dichloroethene	5	1	BDL -	26.00*	26.00*	6	1	BDL -	23.00*	23.00*	5 (b)
1,2-Dichloroethane	5	1	BDL -	3.70	3.70	6	1	BDL -	7.50*	7.50*	5 (a)
Trans-1,2-Dichloroethene	5	1	BDL -	4.80	4.80	6	1	BDL -	10.00	10.00	-
1,1,1-Trichloroethane	5	1	BDL -	36.00	36.00	6	1	BDL -	37.00	37.00	60 (b)
Tetrachloroethylene	5	1	BDL -	3.30	3.30	6	1	BDL -	5.90	5.90	20 (b)
Trichloroethene	5	1	BDL -	3.70	3.70	6	2	BDL -	73.00*	36.60*	5 (a)
Trichlorofluoromethane	5	1	BDL -	2.10	2.10	6	*****	ALL SAMPLES WERE BDL	*****		-
Total Petroleum Hydrocarbons	5	*****	ALL SAMPLES WERE BDL	*****		6	5	BDL -	20.50	5.00	-

Footnotes:

1. All values in ug/l.
2. The sample mean is calculated only from the samples in which the parameter was detected, not the total number of samples.
3. BDL means Below Detection Limit.
4. Duplicate samples were averaged and considered as one value.
5. Round 1 samples collected between December 9-18, 1987; Round 2 samples collected between January 14-28, 1988.
6. This table includes results from the following wells: DMW-1, DMW-2, DMW-3, DMW-4 (the screened interval of these wells ranges from 4791.44 ft to 4861.00 ft.), and D3 and D4 (the screened intervals of these wells are unknown, but the depths of these wells re 97.7 ft and 197 ft., respectively).
7. Standards: (a) USEPA Safe Drinking Water Act Maximum Contaminant Level.
   (b) New Mexico Environmental Improvement Division (NMEID) human health standard for groundwater.
   (c) NMEID - other standards for domestic water supply.
   (d) NMEID - standards for irrigation use.

   If both New Mexico and Federal Standards were available, the lower concentration was selected as the applicable standard.

* Exceeds Standard

SUMMARY OF ANALYTICAL RESULTS OF INORGANIC PARAMETERS DETECTED AT CONCENTRATIONS EXCEEDING AVERAGE REGIONAL BACKGROUND LEVELS

Parameter	No. of Samples	No. of Samples Containing Parameter Above Background Levels	Concentration Range (mg/kg)	Avg. Background Levels (mg/kg) (1)
HWSA #1:				
Arsenic	24	11	<10.0 - 36.0	4 - 10
Cadmium	24	6	<2.0 - 7.5	0.01 - 2.0 (2)
Mercury	24	2	<0.05 - 0.76	0.032 - 0.13
HWSA #3:				
Arsenic	12	5	<10 - 53.0	4 - 10
Cadmium	12	4	<2 - 9.5	0.01 - 2.0
Selenium	12	6	<5 - 120	<0.1 - 0.3
HWSA #4:				
Arsenic	36	21	<10 - 133	4 - 10
Cadmium	36	18	<2 - 13.0	0.01 - 2.0
Iron	36	5	3200 - 30,000	1000-20,000
Mercury	36	1	<0.05 - 0.29	0.032 - 0.13
Selenium	36	24	<5 - 108	<0.1 - 0.3
North Parking Lot:				
Arsenic	54	48	<10 - 72	4 - 10
Cadmium	54	19	<2.0 - 33	0.01 - 2.0
Selenium	54	24	<5.0 - 35	<0.1 - 0.3
Area Adjacent to Well DW8-2:				
Arsenic	6	3	<10 - 55.0	4 - 10
Cadmium	6	3	<2 - 6.5	0.01 - 2.0
Selenium	6	3	<5 - 95.0	<0.01 - 0.3
San Jose Drain:				
Arsenic	3	3	31 - 70	4 - 10
Cadmium	3	2	<2 - 3	0.01 - 2.0
Selenium	3	2	<5 - 22	<0.01 - 0.3
Zinc	3	3	40 - 160	28 - 45

FOOTNOTES:

(1) Source: Schacklette and Boerngen (1984), unless otherwise specified. Average background levels are for central New Mexico soils.

(2) Source: Adriano (1986).

(1464c-7)

SUMMARY OF ANALYTICAL RESULTS OF SOIL SAMPLES FROM HWSA #1 ANALYZED FOR ORGANIC COMPOUNDS

Chemical	Number of Samples	Number Positive IDs	Sample Range Low	Sample Range High	Sample Mean
Volatile Organics:					
Chloroethene vinyl ether	22	1	BDL -	0.27	0.27
Ethylbenzene	22	10	BDL -	0.43	0.38
Methylene Chloride	22	7	BDL -	7.20	5.61
Tetrachloroethene	22	2	BDL -	0.14	0.14
Toluene	22	8	BDL -	0.62	0.32
Trichlorofluoromethane	22	10	BDL -	0.30	0.18
Xylenes	22	10	BDL -	0.63	0.53
Base Neutral Compounds:					
Acenaphthene	22	1	BDL -	0.75	0.75
Anthracene	22	4	BDL -	2.10	1.
Benzo(a)anthracene	22	4	BDL -	3.90	2.
Benzo(a)pyrene	22	1	BDL -	2.10	2.10
Benzo(b)fluoranthene	22	3	BDL -	6.90	4.23
Benzo(k)fluoranthene	22	3	BDL -	6.70	3.17
Chrysene	22	4	BDL -	3.30	1.74
Fluorene	22	1	BDL -	0.45	0.45
Fluoranthene	22	4	BDL -	3.50	2.19
Naphthalene	22	1	BDL -	0.70	0.70
Phenanthrene	22	3	BDL -	0.95	0.74
Pyrene	22	5	BDL -	4.60	2.52

FOOTNOTES:

1. All values in mg/kg.
2. BDL means Below Detection Limit.
3. The sample mean is calculated only from the samples in which the compound was detected, not the total number of samples.

(1464c-8)

SUMMARY OF THE DISTRIBUTIONS OF TOTAL VOLATILE ORGANIC COMPOUNDS DETECTED IN SOILS IN HWSA #1

Depth Interval (ft)	Number of Samples	Number of Detections	Maximum Concentration (mg/kg)	Mean Concentration (mg/kg)(1)
0-2	0	0	0	0
2-4	6	3	8.57	3.46
4-6	3	0	0	0
6-8	3	2	8.58	8.28
8-10	0	0	0	0
10-12	3	0	0	0
12-14	2	0	0	0
14-16	4	2	3.24	2.28
16-18	0	0	0	0
18-20	3	3	7.21	4.80

FOOTNOTES:

(1) The sample mean is calculated only from the samples in which these compounds were detected, not the total number of samples.

(2) The following compounds were the only VOCs detected: trichlorofluoromethane, toluene, ethyl benzene, xylenes, methylene chloride, tetrachloroethylene and chloroethyl vinyl ether.

(3) This table contains data from borings 4 through 15.

(4) Duplicate samples were averaged and considered as one sample.

(1464c-9)

SUMMARY OF THE DISTRIBUTION OF BASE NEUTRAL COMPOUNDS

DETECTED IN SOIL SAMPLES COLLECTED IN HWSA #1

Boring No.	Depth Interval (ft)	Concentration of Total Polycyclic Aromatic Hydrocarbons
SAB009	18-20	5.21 mg/kg
SAB010	2-4	31.07 mg/kg
SAB011	6-8	20.85 mg/kg
SAB013	12-14	10.4 mg/kg
SAB014	0-2	2.29 mg/kg

FOOTNOTES:

1. These are the only samples in which base neutral compounds were detected, and all base neutrals detected were PAHs.

SUMMARY OF ANALYTICAL RESULTS OF ORGANIC COMPOUNDS DETECTED IN SOILS IN HWSA #2, HWSA #3, HWSA #4, THE NORTH PARKING LOT AND THE AREA ADJACENT TO WELL DWB-2

Chemical	Number of Samples	Number Positive IDs	Sample Range Low	Sample Range High	Sample Mean
HWSA #2:					
Chloroform	6	1	BDL -	0.35	0.35
Methylene Chloride	6	4	BDL -	7.40	2.03
Trichlorofluoromethane	6	1	BDL -	1.50	1.50
HWSA #3:					
Methylene Chloride	12	10	BDL -	0.65	0.18
HWSA #4:					
Chloroform	36	4	BDL -	0.23	0.16
Ethylbenzene	36	2	BDL -	0.37	0.36
1,1-Dichloroethene	36	1	BDL -	0.11	0.11
Methylene Chloride	36	24	BDL -	3.30	0.80
Toluene	36	4	BDL -	0.35	0.19
Trichlorofluoromethane	36	10	BDL -	1.20	0.43
Xylenes	36	2	BDL -	0.53	0.52
North Parking Lot:					
Bromomethane	56	8	BDL -	0.18	0.15
Chloromethane	56	10	BDL -	0.21	0.13
Chloroform	56	2	BDL -	0.10	0.10
Methylene Chloride	56	11	BDL -	0.61	0.21
Total Petroleum Hydrocarbons	27	11	BDL -	446.00	84.55
Area Adjacent to Well DWB-2:					
Methylene Chloride	6	1	BDL -	8.20	8.20
Trichlorofluoromethane	6	1	BDL -	1.20	1.20

FOOTNOTES:

1. All values in mg/kg.
2. BDL means below detection limit.
3. The sample mean is calculated only from the samples in which the compound was detected, not the total number of samples.
4. Duplicate samples were averaged and considered as one sample.

(1464c-11)

SUMMARY OF ANALYTICAL RESULTS OF SURFACE WATER SAMPLES FROM THE SAN JOSE DRAIN

Inorganics:

	SJDSW1	SJDSW2	SJDSW3
Aluminum	0.21	<0.2	<0.2
Barium	0.06	0.05	0.06
Boron	0.26	0.22	0.23
Cadmium	0.04	0.01	0.02
Copper	<0.03	<0.03	0.04
Iron	0.12	0.25	0.07
Magnesium	5.8	4.8	4.6
Manganese	0.01	0.03	0.02
Selenium	0.05	<0.05	0.07
Zinc	0.19	0.08	0.15

Organics: None Detected

1. All values in mg/l.
2. This table presents data for surface water samples collected from the San Jose Drain.

(1464c-19)

SUMMARY OF ANALYTICAL RESULTS OF SEDIMENT SAMPLES FROM THE SAN JOSE DRAIN

Inorganics:	SJDSD1	SJDSD2	SJDSD3	Average Background Levels (3)
Aluminum	1,800	6,500	7,000	30,000 - 70,000
Arsenic	31EJ*	64EJ*	71EJ*	4 - 10
Barium	24	120	120	300 - 1500
Boron	7.5	16	16	LT 20 - 50
Cadmium	<2	2.5*	3*	0.01 - 2.0 (a)
Chromium	<4	12	20	30 - 70
Cobalt	<4	7.0	14	LT 3 - 70
Copper	4.5	19	57	LT 1 - 150
Iron	3,800	8,100	8,800	1,000 - 20,000
Lead	130	150	160	10 - 200
Magnesium	670	3,100	3,000	2,000 - 50,000
Manganese	45	170	150	LT 2 - 500
Selenium	<5	22*	11*	LT 0.1 - 0.3
Vanadium	9.5	17	17	30 - 100
Zinc	46EJ*	110EJ*	160EJ*	28 - 45
Organics:				
Trichlorofluoro-methane	ND	0.140	ND	
Total Petroleum Hydrocarbon	135	242	403	

1. All values in mg/kg (ppm).

* Indicates that this value exceeds average background levels.

2. This table presents data for sediment samples collected from the San Jose Drain.

3. Source: Shacklette and Boerngen (1984), unless otherwise specified.
   (a) Source: Adriano (1986). Average background levels are for central New Mexico soils.

4. EJ: Estimated.

SUMMARY OF INORGANIC RESULTS FOR SOIL SAMPLES

COLLECTED IN THE NORTH SECTOR

Element	Average Background Levels(1)	Number of Samples	Maximum Concentration	Number of Detections	Mean Concentration(2)
Aluminum	30,000-70,000	104	40,000	NA	NA
Antimony	LT 1	104	ND	NA	NA
Arsenic	4-10	104	133 *	77	39.1 *
Barium	300-1500	104	360	NA	NA
Beryllium	LT 1-1.5	104	1.0	NA	NA
Boron	LT 20-50	104	73 *	101	19.2
Cadmium	0.01-2.0(3)	104	15 *	48	4.6 *
Chromium	30-70	104	27	NA	NA
Copper	LT 1-150	104	29	NA	NA
Iron	1000-20,000	104	30,000 *	104	8758
Lead	10-200	104	130	NA	NA
Magnesium	2000-50,000	104	26,000	NA	NA
Manganese	LT 2-500	104	550 *	104	144.6
Mercury	0.032-0.13	104	0.29 *	5	0.10
Molybdenum	LT 3	104	6.5 *	1	6.5 *
Nickel	LT 5-20	104	65 *	23	10.5
Selenium	LT 0.1-0.3	104	120 *	55	37.0 *
Silicon	270,000-350,000	104	570	NA	NA
Silver	0.7(3)	104	ND	NA	NA
Thallium	0.1-0.8(3)	104	ND	NA	NA
Vanadium	30-100	104	53	NA	NA
Zinc	28-45	104	310 *	104	20.9

FOOTNOTES:

1. All values in mg/kg (ppm).
2. This table presents data for samples collected from borings 16-40 and 44-70.
3. Sample depths ranged from 0-2 to 16-18 ft below grade: sample locations are shown in Figure II-15 of the Remedial Investigation Report.
4. LT means less than.
5. * indicates that this value exceeds average background levels.
6. NA means not applicable because the maximum concentration detected of this element did not exceed average background levels and is therefore not further evaluated.

(1) Source: Shacklette and Boerngen (1984), unless otherwise specified. Average background levels are for central New Mexico soils.

(2) The sample mean is calculated only from the samples in which the element was detected, not the total number of samples.

(3) Source: Adriano (1986).

(1464c-5)

SUMMARY OF INORGANIC RESULTS FOR SOIL SAMPLES

COLLECTED IN THE SOUTH SECTOR

Element	Average Background Levels(1)	Number of Samples	Maximum Concentration	Number of Detections	Mean Concentration (2)
Aluminum	30,000-70,000	24	25,000	NA	NA
Antimony	LT 1	24	ND	NA	NA
Arsenic	4-10	19	36 *	11	17.3 *
Barium	300-1500	24	180	NA	NA
Beryllium	LT 1-1.5	24	1.0	NA	NA
Boron	LT 20-50	24	28	NA	NA
Cadmium	0.01-2.0(3)	24	7.5 *	6	3.6 *
Chromium	30-70	24	17	NA	NA
Copper	LT 1-150	24	12	NA	NA
Iron	1000-20,000	24	18,000	NA	NA
Lead	10-200	24	30	NA	NA
Magnesium	2000-50,000	24	6500	NA	NA
Manganese	LT 2-500	24	310	NA	NA
Mercury	0.032-0.13	24	0.76 *	2	0.46 *
Molybdenum	LT 3	20	ND	NA	NA
Nickel	LT 5-20	24	6	NA	NA
Selenium	LT 0.1-0.3	23	53 *	23	23.3 *
Silicon	270,000-350,000	24	302	NA	NA
Silver	0.7(3)	24	ND	NA	NA
Thallium	0.1-0.8(3)	24	ND	NA	NA
Vanadium	30-100	24	130 *	24	21.1
Zinc	28-45	24	34	NA	NA

FOOTNOTES:

1. All values in mg/kg (ppm).
2. This table presents data for samples collected from borings 4 through 15.
3. Sample depths ranged from 0-2 to 18-20 ft below grade: sample locations are shown in Figure II-14 of the Remedial Investigation Report.
4. LT means less than.
5. * indicates that this value exceeds average background levels.
6. NA means not applicable because the maximum concentration detected of this element did not exceed average background levels and is therefore not further evaluated.

(1) Source: Shacklette and Boerngen (1984), unless otherwise specified. Average background levels are for central New Mexico soils.

(2) The sample mean is calculated only from the samples in which the element was detected, not the total number of samples.

(3) Source: Adriano (1986).

ATTACHMENT SIX

GROUNDWATER STANDARDS

GROUNDWATER STANDARDS

Groundwater standards for regulation of the specific contaminants can be found in the Safe Drinking Act and the New Mexico Water Quality Control Commision Regulations for Dischartes Onto or Below the Surface of the Ground. However, the controlling factor in setting standards for the Former Air Force Plant 83/General Electric portion of the South Valley site is neither of these. It is instead New Mexico Groundwater Control Commission (NMWQCC) Regulation Section 3-103A which says in part "... If more than one water contaminant affecting human health is present, the toxic pollutant criteria of Section 1-101.UU for the combination of contaminants or the Human Health Standard of Section 3-103.A for each contaminant shall apply, whichever is more stringent." Section 1-101.UU says in part:

> **Any water contaminant or combination of the water contaminants in the list below creating a lifetime risk of more than one cancer per 100,000 exposed persons is a toxic pollutant.**
>
> **acrolein**
> **acrylonitrile**
> **aldrin**
> **benzene**
> **benzidine**
> **carbon tetrachloride**
> **chlordane**
> **chlorinated benzenes**
> - **monochlorobenzene**
> - **hexachlorobenzene**
> - **pentachlorobenzene**
> - **1,2,4,5-tetrachlorobenzene**

> **chlorinated ethanes**
> - **1,2-dichloroethane**
> - **hexachloroethane**
> - **1,1,2,2-tetrachloroethane**
> - **1,1,1-trichloroethane**
> - **1,1,2-trichloroethane**

> **chlorinated phenols**
> - **2,4-dichlorophenol**
> - **2,4,5-trichlorophenol**
> - **2,4,6-trichlorophenol**

> **chloroalkyl ethers**
> - **bis (2-chloroethyl) ether**
> - **bis (2-chloroisopropyl) ether**
> - **bis (chloromethyl) ether**

> **chloroform**
> **DDT**
> **dichlorobenzene**
> **dichlorobenzidine**
> **1,1-dichloroethylene**
> **dichloropropenes**
> **dieldrin**
> **2,4-dinitrotoluene**
> **diphenylhydrazine**

endosulfan
endrin
ethylbenzene
halomethanes
    bromodichloromethane
    bromomethane
    chloromethane
    dichlorodifluoromethane
    dichloromethane
    tribromomethane
    trichlorofluoromethane
heptachlor
hexachlorobutadiene
hexachlorocyclohexane (HCH)
    alpha-HCH
    beta-HCH
    gamma-HCH
    technical HCH
hexachlorocyclopentadiene
isophorone
nitrobenzene
nitrophenols
    2,4-dinitro-o-cresol
    dinitrophenols
nitrosamines
    N-nitrosodiethylamine
    N-nitrosodimethylamine
    N-nitrosodibutylamine
    N-nitrosodiphenylamine
    N-nitrosopyrrolidine
pentachlorophenol
phenol
phthalate esters
    dibutyl phthalate
    di-2-ethylhexyl phthalate
    diethyl phthalate
    dimethyl phthalate
polychlorinated biphenyls (PCB's)
polynuclear aromatic hydrocarbons (PAH)
    anthracene
    3,4-benzofluoranthene
    benzo(k) fluoranthene
    fluoranthene
    fluorene
    phenanthrene
    pyrene
tetrachloroethylene
toluene
toxaphene
trichloroethylene
vinyl chloride

xylenes
    o-xylene
    m-xylene
    p-xylene

1,1-dichloroethane
ethylene dibromide (EDB)
cis-1,2-dichloroethylene
trans-1,2-dichloroethylene
naphthalene
1-methylnaphthalene
2-methylnaphthalene
benzo-a-pyrene

The carcinogenic risk from chronic exposure to contaminated groundwater can be calculated using certain standard assumptions. These assumptions include the following:; Consumption of 2 liters of water a day for 70 years at a body weight of 70 kilograms. The values used for the concentrations of contaminants are a combination of values for the two wells. Concentrations of contaminants come from a sample of the water under consideration.

The calculations are done as follows:

$$\frac{\text{Concentration of contaminant (part per million)} \times \frac{2 \text{ liters}}{\text{day}} \times \text{cancer potency factor}}{\text{70 kilogram body weight}} = \text{increased lifetime cancer risk}$$

This calculation would be done for each contaminant using cancer potency factors from the Environmental Protection Agency's Cancer Assessment Group. These factors are a measure of the potential of the chemicals carcinogenic properties and are available through the Integrated Risk Information System (IRIS). The individual calculated increased lifetime cancer risks would then be added to give a combined risk. It is this combined risk to which NMWQCC Section 3-103.A would apply for combined effects.